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Least Square Analysis of Variance for the Assessment of Natural Consequences for Birth Weight, Weaning Weight, Yearling Weight, Pre-Weaning Daily Weight Acquire, and Greasy Fleece Weight of Kajli Sheep in Pakistan

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1. Abstract

The current study was completed to analyze the effect of natural components on various improvement affecting traits of Kajli sheep in Pakistan. For this reason, we apply two huge contemporary datasets in sheep to explore factors that influence the traits. Therefore, the generation information record of 13715 Kajli sheep lambing accumulated from 1994 to 2010 at Livestock Experimental Stations Khushab and Khizarabad, Punjab. Information records were genuinely analyzed through utilizing PC modified Mixed Model Harvey's Least Squares and Maximum Likelihood. The two farms information data was analyzed by utilizing an animal model program. The factual model was incorporated to evaluate the Birth Weight (BW), 120 days at Weaning Weight (WW), Pre-Weaning Average Daily Gain (PRADG), Yearling Weight (YW) and Greasy Fleece Weight (GFW). Year of Birth (YOB), Birth Season (BS), Birth Types (BT) and sex was the fix effect in the model. Results indicated that, the overall general values for birth weight, weaning weight, yearling weight, pre-weaning weight and fleece weight were noted. Year of birth, type of birth, sex, and herd was influenced altogether significantly while, birth weight and greasy fleece weight, the period of birth showed no essential difference. In weaning weight and pre-weaning increment normally, year of birth, sort of birth and herd showed a critical contact except for sex. Male sheep were heavier than female sheep and single conceived sheep were also basically heavier than twins were during offspring birth. Results emulate that the Kajli sheep breed can be improved on through selection and further developed management. The cascade type of influence of the current investigation has levelheaded ramification not just for sheep farming by and by just as for intensified associate of boundaries which definitely convince deviation of weight, weight has become itself essential forecaster of in a matter of seconds wellness results. These outcomes displayed there are complex associations among hereditary qualities and ecological elements of parental, placental and fetal beginning. These are profoundly affected traits by maternal sustenance, genes, be concerned, the executive, environment, occasional diversity of seasons.

2. Introduction

Small ruminants in spite of the fact that are significant wellspring of animal creation in agricultural nations like Pakistan appear to have little consideration from veterinary consideration and production improvement. They are the primary stockpile of meat fleece and are utilized in formal merriment all through the nation, giving significant exchange. They are additionally a wellspring of compost; Pakistan has in excess of 109 million heads of small ruminants having 30.9 million sheep and 78.2 millions goats individually, [1]. Twenty eight breeds of sheep have been reported in Pakistan including Northern region, Azad Jammu and Kashmir (Hasnain, 1985) [2]. Sheep breeds of Punjab are Lohi (Parkanni or Lamocher), Kajli, Thalli, Salt Range, Sipli, Buchi (Bahawalpuri) and Cholistani. Small ruminants add by and large to the economy of poor farmers. At the point when blended farming is polished, sheep farming a compelling correlative part of a blended farming framework. Nonetheless, disregarding their significance to Pakistan's economy, sheep and goat got inadequate consideration and helpless help. Hence the crude person of sheep and goat rising is as yet a typical element. Kajli is renowned because of its succulent sheep quality and the males are consequently swelled particularly available to be purchased as conciliatory animals. Kajli sheep is one of the local breed and is found in the flooded spaces of focal Punjab (Districts of Sargodha, Khushab, Gujrat, Mandi Bahaud-Din, and Mianwali). Kajli sheep is for the most part raised for lamb, fleece and every so often for milk production. Wide variety exists in different creation and propagation characteristics of Kajli sheep which demonstrates an incredible breadth of progress in these attributes of financial significance. The beneficial and conceptive characteristics are influenced by genotype just as climate. Already, a couple of studies have been coordinated on Kajli sheep yet climatic and occasional differences from one year to another effect the production of whole flock. Regardless, the exhibit characteristics are moreover affected by climate. Among these biological components, environment and occasional differences among different years impact the production of the whole flock, while sex, sort of birth, age and weight impact the singular execution. The breed is local of Sargodha, Khushab, fraction of Mianwali and Gujrat region in Punjab. The animals are huge leggy having white body coat. They have huge head with an ordinary roman nose having dark circles around the eyes, (Hasnain, 1985) [2]. The productive and reproductive attribute are affected by climate just as genotype. The hereditary relationships additionally give the data that genes influencing one attribute likewise influence different characteristics; the viability of determination and net hereditary advancement can be estimated when selection is made for more than one attribute. Very little data on the hereditary parts of production and reproduction performance of Kajli sheep in Pakistan was accessible, hence the current study, has been plan ready for investigation of different performance attribute of financial significance of this breed. The qualities of monetary significance in sheep incorporate birth weight, weaning weight, yearling weight and fleece weight. These characteristics are influenced by a few hereditary and natural elements viz. sex of sheep, type of birth, climatic and occasional variation during various years. Among these variables, climatic and seasonal variation from one year to another year, influence animal of entire flock, while, sex of sheep, kind of birth and age influence performance of an indivual. It is in this way, vital for estimate the degree of this load of components with the goal that the hereditary variety among animals can be utilized to configuration reproducing plans for additional improvement. Keeping in view these realities, the current study has been planned with the accompanying goals: To assess the performance of Kajli sheep, and to decide the impact of natural elements on different performance traits in Kajli sheep. I have effectively already published portion of the concerned information of the kajli sheep performance. The goal of this investigation was to assess the exhibition of a thoroughbred run of Kajli sheep kept up with at Livestock Experimental Station Khushab and Livestock Experimental Station Khizrabad (Sargodha). Information and date records on performance traits as Birth weight, Weaning weight, Yearling weight and Greasy wool weight from 1994 to 2010 were gathered, an effort was made to investigate the impact of all ecological and non hereditary components on the performance of animals. For this purpose LSMLMW PC program was utilized (Figure 1).

3. Materials and Methods

Source of data, background and location of the farm

Pedigree, Family and performance information of Kajli sheep kept up with at Livestock Experimental Station, Khushab (LES) and Livestock Experiment Station (LES) Khizarabad, locale Sargodha during 1994 to 2010 were used in the current research project. These two farms are arranged in the focal Punjab around 80 kilometers separated. The Livestock Experiment Station Khizarabad was initially begun as a land award farm under the arrangement of colonization of Government Lands (Punjab) Act of 1912. The state of the rent was to keep up with various types of buffalo, cattle and Kajli sheep. The principle objective of the homestead was to save, conserve and to further develop the production capability of the existing breed nearby.

It was likewise pointed toward delivering pedigreed bulls for the improvement of neighborhood breeds of domesticated animals. During 1976, the homestead was taken over by the Government of Punjab. The Livestock Experiment Station Khushab was set up during 1976 and some buffalo and Kajli sheep were moved from Khizerabad. The region is waterway flooded and environment is somewhat dry and rains generally happen during the long stretch of July to September. During late spring months, day temperature might go as high as 50 ^{0}C and during winter night temperature might fall up to – 4^{0}C.

Figure 1: Kajli Sheep breed of different ages and sex at various locations of Khushab and Khizarabad

3.1. Selection of Breeding Stock

The reproducing ewes have been chosen from and among the homestead created female stock principally based on conformity and breed attributes and some weightage was additionally given to development qualities, body size and fleece production. The choice of the males was, nonetheless, at first dependent on family data and performance records. For the most part, the ewes were bred once per year in autumn time season and lambs got during spring season. Nonetheless, in certain years two times every year breeding of the ewes was practiced however later on it was ceased for oversee mange mental reasons. The ewes which were not bred during fall season were mated in the resulting spring season to lamb during the autumn time season. The animals were uncovered double a year i.e., spring and pre-winter. The rams utilized in breeding were generally farm created yet outside acquaintance had additionally been finished with give hereditary heterogeneity to decrease the inbreeding. Regularly 10-15 rams for every season were chosen and utilized for breeding purpose. Significant push in generally reproducing plan had been the improvement of meat creation and a little consideration had been paid to fleece attributes.

3.2. General Management and Feeding Practices

The animals were kept up with in open walled in areas consistently. The grown-up animals were kept in open barn with satisfactory covered region to give shade and safe house during unforgiving climate. All animals were sent out for grazing from 8:00am to 5:00 pm in the late spring and spring season however in the colder time of year season with little alteration in the brushing plan from 9:00 am to 4:30 pm. The feeding taking care of the animals was predominantly through brushing and grazing of accessible occasional grain and forages yet concentrates were enhanced during shortage period and in breeding seasons for flushing. Young herd for example lambs were for the most part kept in entryway. They were permitted to nurse their dams openly from evening through night till ewes were taken out for grazing in the first part of the day. The lambs were offered green fodder and enhanced concentrates from 10-15 days old enough. Every one of the lamb were totally weaned on fixed date and moved to isolate pen for post weaning rising. The animals were immunized against Enterotoxaemia, Foot and Mouth sickness, Sheep Fox, Pleuro Pneumonia and Hemorrhagic Septicemia. The composition of feed differed by the feed crops accessible during the year. Green jowar (Andropogon sorghum), maize (Zea Mays).and guara (Cyamposis psoraliodes) were fed during the long periods of May to October. During November to April, green berseem, (trifolium alexandrium), oats (Avena sativa), and mixture of rape (Brasica napus) were principally given to these animals. Dry straws contained guara (Cyamposis psoraliodes), gram and wheat (Triticum species). The concentrate blend was made out of squashed oats (Avena sativa), wheat grain and oil seed cakes (cotton-seed, rapeseed, and so on) Pieces of normal salt (sodium chloride) were likewise given in the mangers to free decision licking. Water was provided 24 hours in the outbuildings. These feeding practices stayed uniform all through the study period aside from a couple of changes, as and when required. By and large the animals were shorn double a year i.e., in spring and autumn seasons. The lamb brought into the world in spring was first shorn in fall season as well as the other way around. From there on, the shearing of every animal was done after at regular intervals.

3.3. Description of Data Set and Statistical Analysis

Pedigree and performance information of Kajli sheep kept up with at Livestock Experimental Station, Khushab and Khizarabad

(Sargodha) gathered during 1994 to 2010 were utilized in present research project. Data on after lines was gathered, Individual Identity, Ram, Dam, Date of birth, Date of lambing, Sex of sheep, Type of birth, Birth weight, Weaning weight, Yearling weight, Greasy wool weight (Autumn and Spring). The performance characteristics analyzed in the current investigation included: Birth Weight, Weaning weight, Yearling weight, Pre-weaning weight acquire, Greasy fleece wool weight. Information on different performance traits was indisputably examined to magnitude the extent of different non-hereditary sources of variety in these characteristics. Before information investigations a few alters were performed to eliminate the anomaly. Just typical and complete normal records were considered for analysis. For data entry information passage MS-Excel accounting spreadsheet were utilized.

3.4. Evaluation of Environmental Effects

Information and data on different performance characteristics were analyzed to assess the impact of different natural/environmental elements (Non-hereditary source of variety) like year and period of birth/lambing, sex of sheep conceived, age of dam, kind of birth, weaning age and so forth on birth weight, weaning weight, yearling weight, fleece yield, as fitting, on different execution were evaluated. Sheep is normally considered as occasional breeder Kajli sheep for the most part displays estrous during two seasons' autumn time and spring. Due to managemental comfort they are bred during autumn time season. In any case, some extent of populace likewise shows estrous round the year. The extended time of birth or lambing was partitioned into following two seasons and the meaning of period of birth/lambing was as per the following: spring (January to June) and autumn (July to December).

The mathematical model assumed was:

$$Y_{ij} = \mu + F_i + e_{ij} \qquad \text{(Model)}$$

Where,

Y_{ij} = measurement of particular trait

μ = population mean

F_i = the effect of all fixed effects with the restriction that $\sum Fi = 0$

e_{ij} = the random error associated with each observation.

The Harvey's Least Squares Maximum Likelihood Mixed Model (LSMLMW) computer software was used for all these analysis. (Harvey, 2000) [3].

4. Results and Discussion

Information on 13715 lambing and performance records of sheep kept at Livestock Experiment Station Khushab and Khizerabad, region Sargodha (Pakistan) spread over a time of a long time from 1994 to 2010 were utilized in the current investigation. An effort was made to assess the size of different environmental/natural source of variety in various useful characteristics of financial significance.

4.1. Birth Type and Sex

The level of single conceived sheep in the herd was exceptionally high around 84%. The twining rate in the group was 15.73 percent. The sex proportion was practically 49:51 males and females.

4.2. Phenotypic Performance

The unadjusted mean±SD, least squares mean±SE, and coefficient of variation for various performance characteristics as gotten in the current study are introduced in (Table1).

Table 1: Mean values for some performance traits in sheep

Traits	No.	Un adjusted mean± S.D	Mean ± S.E	C.V.%
Birth weight (kg)	13715	4.32±0.76	4.13±0.010	13.24
Weaning weight(kg)	9331	19.42±3.52	18.70±0.08	17.08
Yearling weight(kg)	6121	36.43±2.74	37.52±0.06	06.03
Pre weaning daily gain(gms)	9331	148.82±39.37	142.34±0.83	23.0 3
Spring greasy fleece weight (kg)	9031	0.98±0.22	1.32±0.00	18.90
Autumn greasy fleece weight (kg)	9031	0.98±0.22	1.32±0.00	18.89

4.3. Environmental/Natural Factors Affecting Performance Traits

The impact of different natural elements on various performance characteristics of sheep was concentrated by least square investigation of fluctuation utilizing Harvey's Mixed Model Least Square and Maximum Likelihood (LSMLMW) Computer Program (Harvey 2000) [3]. The outcomes got for every quality are introduced in the accompanying passages.

4.4. Birth weight

The investigation of fluctuation to assess the impact of year of birth, period of birth, sex, kind of birth is given in (Table 2).

The least squares means and standard errors for birth weight of sheep during various years and periods of birth and other fixed impacts have been given in (Table 2). The distinction at all squares means in birth weight has been found for both the groups viz; Khizerabad and Khushab. The Khushab herd showed higher least squares means in birth weight than Khizerabad.

Table 2: Least squares analysis of variance to find out the environmental effects on birth weight

SOV	D.F	S. Square	M. Square	F, R atio	Prob
Year of Birth	16	325.82	20.36	62.15	0.00
Season of Birth	1	0.12	0.12	0.37	0.54
Sex	1	637.92	637.92	1946.72	0.00
Type of Birth	1	1543.49	1543.49	4710.23	0.00
Sex *Type of Birth	1	2.93	2.93	8.93	0.00
Flock	1	103.66	103.66	316.34	0.00
Remainder	13693	4487.04	0.33		
Total	13715	7886.68			

4.5. Weaning Weight

Assessment of variation uncovered critical impact of year, kind of birth, age of the dam, group and period of birth on weaning weight. Be that as it may, the distinction because of sex was not significant (Table 3).

The distinction at all squares means in weaning weight has been found for both the flocks, viz, Khizerabad and Khushab. The Khizerabad herd showed higher least squares implies in weaning weight than Khushab ranch.

Table 3: Least squares analysis of variance to predict the environmental effects on Weaning Weight

SOV	**D.F.**	**S.Square**	**M.Square**	**F.Ratio**	**Prob**
Year of birth	15	7249.73	483.31	43.91	0.00
Season of birth	1	6462.34	6462.34	587.14	0.00
Sex	1	0.04	0.04	0.00	0.94
Type of birth	1	102.86	102.86	9.34	0.00
Flock	1	137.37	137.37	12.48	0.00
Regressions					
Weaning age	1	141.02	141.02	12.81	0.00
Birth Weight	1	3.33	3.33	0.30	0.58
Remainder	9309	102459.32	11.00		
Total	9330	116239.71			

4.6. Yearling Weight

In general yearling weight variation in body weight because of year, period of birth and sex were Huge. Though, impact of herd and kind of birth were show, non significant. Weaning age of the sheep and birth weight had a non huge impact on yearling weight though weaning weight of the lamb's had significant consequence and affected the trait under discussion in (Table 4).

The distinction at all squares means in yearling weight has been found for both the herds viz; Khizerabad and Khushab. The Khushab group showed higher least squares means in yearling weight than Khizerabad.

Table 4: Least squares analysis of variance to find out the environmental effects on Yearling Weight

SOV	**D.F**	**S.Square**	**M.Square**	**F.Ratio**	**Prob**
Year of birth	15	4443.09	296.20	61.47	0.00
Season of birth	1	77.88	77.88	16.16	0.00
Sex	1	8895.97	8895.97	1846.36	0.00
Type of birth	1	1.25	1.25	0.261	0.60
Flock	1	3.08	3.08	0.63	0.42
Regressions					
Weaning age	1	3.57	3.57	0.74	0.38
Birth Weight	1	2.41	2.41	0.50	0.47
Weaning weight	1	1220.46	1220.46	253.30	0.00
Remainder	6098	29360.74	4.81		
Total	6120	46270.67			

4.7. Pre-Weaning average Daily Gain

The analysis of variance uncovered that year and period of birth and birth type showed significant impact on pre-weaning normal day by day acquire while sex had non-significant impact on the characteristic (Table 5). The regression of weaning weight and birth weight on pre-weaning normal every day acquire were significant.

Table 5: Least squares analysis of variance for the evaluation of environmental effects on Pre weaning daily weight gain

SOV	**D.F.**	**S.Square**	**M.Square**	**F.Ratio**	**Prob**
Year of birth	15	628619.74	41907.98	35.67	0.00
Season of birth	1	510142.89	510142.89	434.20	0.00
Sex	1	67.01	67.01	0.05	0.81
Type of birth	1	4722.13	4722.13	4.01	0.04
Flock	1	13556.66	13556.66	11.53	0.00
Regressions					
Weaning age	1	2016721.79	2016721.79	1716.52	0.00
Birth Weight	1	250713.31	250713.31	213.39	0.00
Remainder	9309	10937023.57	1174.88		
Total	9330	14465010.74			

5. Discussion

5.1. Birth Type and Sex Ratio

The level of single conceived sheep in the flocks was extremely high and was around 84%. The twining rate in the flock was 16%. The sex proportion was just about 49: 51 males and females. The level of birth type and sex proportion ratio in various breeds reported by Akhtar (1996) [4] as twinning rate in the Hissardale sheep flock was 19% and sex proportion was 52.5: 47.5 males and females, individually which was in concurrence with the current study. The slight contrast was because of the breed and furthermore might be expected to the managemental contrasts.

5.2. Phenotypic Performance

The birth weight of Kajli sheep in the current study found the mean value of 4.16±0.01 kg and it was in concurrence with numerous scientists who announced birth weight in various types of sheep kept up with in various natural conditions (Qureshi et al 2010; Hussain et al., 2006) [5, 2]. The normal birth weight in Kajli sheep announced by Qureshi et al (2010) was 3.8 and 4.1 kg at Khushab and Khizarabad (Pakistan). Dixit et al., (2001) [2] announced normal sheep weight as 3.1±0.03 kg in Bharat Merino in India. Akhtar et al., (2001) [7] had announced sheep weight as 4.0±0.51 kg in Hissardale sheep kept at LES Jahangirabad. Babar et al., (2004) [8] reported least squares mean for birth weight as 3.59±0.02 kg in Lohi sheep though, Hussain et al., (2006) [2] reported the average weight at entering the world as 4.11±0.82 kg in Thalli sheep kept at LES Rakh Ghulaman. These scientists have reported the low birth weight than the discoveries of the current investigation. These distinctions might be because of contrast in breeds, areas, size of informational index or other managemental rehearses. The average weaning weight of sheep as gotten in the current investigation was 18.70±0.08 kg. The weaning weight of Kajli in the current study was higher than many breeds of sheep (Bharat Merino, Muzaffarnagri) as reported by Dixit et al., 2001. Sinha et al. (1997) [9] announced that the weaning weight of Muzaffarnagri sheep was 16.82±0.37 kg. Dixit et al. (2001) [6] announced the average sheep weight were 15.0±0.2 kg at weaning in Bharat Merino. Notwithstanding, some various scientists (Babar 1994; Akhtar 1996; Qureshi et al 2010)[8, 4, 5] revealed higher weaning weight when contrasted with the weaning weight of reported in the current study. Babar (1994) [10] revealed that weaning weight in Lohi sheep arrived at the midpoint of 23.09±0.13 kg. Akhtar (1996) [4] reported that the weaning weight of Hissardale sheep reached at the midpoint of 20.1±3.86 kg. The yearling weight of Kajli as study in the current investigation was 37.52±0.06 kg. The yearling weight detailed by Akhtar (1996) [4] was 30.7±3.83 kg which was not exactly the yearling weight investigated in the current study. Pre-weaning average every day weight acquire as researched in the current investigation was 142.34±0.83 gm. Akhtar (1996) [4] reported 135±0.04 gm pre-weaning average every day weight in Hissardale sheep. Dixit et al. (2001) [6] reported pre- weaning average every day weight acquires as 133±1.6 gm in Bharat Merino. Hussain (2006) [2] announced pre-weaning normal day by day weight acquires in Thalli sheep was 0.12±0.04 kg which was lower than the discoveries of the current research report.

5.3. Environmental Factors Affecting Performance Traits of Kajli Sheep

Birth Weight

Birth weight fluctuates altogether because of year, seasons, sex of sheep conceived, sort of birth, age of the dam and flock/group. The significant impact of year, seasons, and sex of sheep conceived, and kind of birth and time of dam on birth weight as gotten in the current research project was in concurrence with numerous specialists (Hussain et al., 2006; Ali et al., 2006) [2, 11]. Dixit et al. (2001) [6] reported that year and period of lambing, sex of lamb, kind of birth, and time of dam were huge wellsprings and significant of variety for lamb birth weight in Bharat Merino sheep. Akhtar et al. (2001) [7] announced that the birth weight in Hissardale was essentially influenced by year, season, and kind of birth, sex and age of the dam. Babar et al. (2004) [8] meticulous that the traits was essentially impacted continuously and period of birth, sort of birth and sex of sheep conceived. The period of dam additionally has huge impact on birth weight of sheep. Hussain et al. (2006) [2] exposed the analysis of difference showed impact of year of birth, sex, kind of birth and impact old enough of dam on birth weight was huge. Nonetheless, the discoveries of Qureshi et al (2010) [5] were in fractional concurrence with the current investigation. Qureshi (1996) [12] revealed birth weight of sheep at Khushab and Khizarabad in Kajli sheep, which was essentially impacted by station, year of birth, age of the ewe, sex and birth type. Anyway the impact of season on birth weight was non-significant. The variation of birth weight in sheep at various years reflects the degree of the executive, some ecological impacts like, temperature and moistness just as the accessibility of feed. It has been commented that the degree of the executive will undoubtedly change as indicated by the capacity of the herd supervisor, his arrangement of yield cultivation, techniques and power of separating and his productivity in the management of homestead works just as accessibility of monetary assets (Akhtar 1996). The administration of homestead probably been changed often and its belongings are reflected in the exhibition attributes throughout the long term. The birth weight of lambs additionally differed with sex and kind of birth. Single conceived sheep are heavier than the numerous conceived sheep as they have better open doors in the uterus of their dams when contrast with various conceived sheep. Additionally, the male lamb were heavier upon entering the world as the gestation time of male are somewhat more when contrast with females (Babar 1994) [10]. Gbangboche et al. (2006) [13] announced that a linear model including the decent impact of birth season, birth year, and number of ewe and sex of lamb was utilized for analysis of variation by least squares. Sheep brought into the world in the dry season were the heaviest. Single lamb and male lamb were heavier than twins and females. Lambs from ewes of third and fourth parity were heavier. Various reports in writing demonstrated that solitary conceived sheep just as the male lamb were heavier than different births and females. As in the current examination the birth weight of male is heavier than female, also the single conceived have heavier birth weight than twin. The period of dam likewise significantly affected birth weight of sheep. Youngest and extremely old ewes would in general deliver lighter lamb when contrasted with ewes somewhere in the range of 3 and 6 years old.

More birth weight of lamb from mature ewes might be credited to the huge size of the uterus with the progression old enough of the ewe. The adult ewes subsequent to accomplishing full development and improvement could save a portion of the energies for better sustenance of lamb in the uterus. In any case, extremely old ewes because of their teeth could maybe not use the feed appropriately bringing about the lamb of less weight. All around chose and appropriately took care of ewes generally created substantial lamb upon entering the world. The most extreme lambing were accounted for in spring season while least were accounted for in harvest time and just a little were accounted for in slow times of year. This shows the irregularity of reproducing in Lohi sheep under Pakistan climatic conditions. The birth weight shifted essentially because of period of birth. The most extreme number of lambing occurred in winter season. The birth weight of spring conceived sheep was heavier than winter conceived sheep. Heavier load of lamb upon entering the world during spring season might be because of season only before lambing (in spring season), plentiful amount of good quality feed (Berseem and Lucern) was accessible to the ewes and it would be advised to impact on the strength of ewe and its offspring bringing about higher weight of lamb upon entering the world. Likewise shortage of good quality grain in pre-winter season might have some unfriendly impacts on broad wellbeing of the ewes bringing about higher birth weight of lamb brought into the world during winter season.

5.4. Weaning Weight

Analysis of variance uncovered that time of birth and period of birth had huge impact on weaning weight and there was a non-significant impact in sex of lamb. Sort of birth, group and time of dam had huge impact on the characteristic. The discoveries of numerous analysts were in halfway concurrence with the current investigation. Qureshi et al (2010) [5] study revealed huge contrasts because of year and period of birth, time of ewe, raising position and weaning age for generally weaning weight while birth type and sex had non-significant huge impacts on the characteristic in Kajli sheep kept at LES Khushab and Khizarabad during the period 1980-1994. Bathaei and Leroy (1998) [14] assessed weaning weight got by least-squares methodology. Year of birth, sex, sire and sort of birth altogether impacted all development bend boundaries in Mehraban Iranian sheep. Dixit et al (2001) [6] gave a detailed that year and period of lambing, sex of lamb, sort of birth, time of dam and ewe weight were critical wellsprings of variety for lamb weight and every day gains in Bharat Merino sheep. Akhter et al (2001) [7] announced that the weaning weight of Hissardale sheep was influenced altogether by year and period of birth and sex of the lamb. The impact in sort of birth of the sheep and age of the dam on weaning weight was anyway non-significant. Hussain et al (2006) [2] study uncovered huge impact of year, sex and period of birth and association between period of birth into sex of sheep and period of birth into kind of birth were discovered significant on weaning weight. While, the distinctions in weaning weight of lamb because of birth type and sex into sort of birth connection and straight impacts old enough of dam on weaning weight were non-significant. The birth weight of lamb significantly affected weaning weight showing that the lamb of higher birth weight had grown up better to weaning when contrasted with sheep having lighter weight upon entering the world. Period of birth had significant impact on weaning weight. The greatest weight was noticed for the lamb brought into the world during winter season while the lamb brought into the world during spring season had the base weight at weaning.

5.5. Yearling Weight

The aftereffects of the current examination showed significant impacts in year of birth, period of birth and time of dam on yearling weight. There was a huge impact of sex on the attribute. Sorts of birth and group have non-significant impact on the trait. Numerous scientists revealed comparative outcomes in various types of sheep kept at various areas and managemental conditions. Akhtar (1996) [4] led an investigation on Hissardale sheep and reported that variety in yearling body weight because of year and sex was significant. Nonetheless, the impact of season and sort of birth on yearling body weight was non-huge and this was in fractional concurrence with the current analysis. Qureshi et al (2010) announced that analysis of fluctuation showed huge contrasts in generally yearling body weight, because of year of birth and period of birth and birth type. Notwithstanding, the impact of dam age on in general yearling weight was non-significant and it was somewhat in concurrence with the current analysis. Hussain (2006) [2] reported that the variation in yearling body weight because of year of birth, sex and sort of birth were significant. Notwithstanding, the impacts of season and collaboration among birth and birth type on yearling weight were non-significant and it was additionally somewhat in concurrence with the current examination. The period of birth significantly affected yearling weight. The lamb brought into the world during spring season had greatest weight at one year age followed by the lamb brought into the world during winter season. The lamb brought into the world during spring season had the most noteworthy birth weight and a similar pattern stayed during development period which finished into higher weight at one year age.

5.6. Pre-Weaning Normal Day by Day Weight Acquire

The extended period of birth, period of birth, sort of birth and group have significant impact, while sex has non-significant. Birth weight likewise has huge impact on pre-weaning normal day by day weight acquire. Babar (1994) [10] analyzed information on 3973 sheep and detailed that solitary conceived sheep acquired than sheep brought into the world as different. The male lamb had more day by day weight acquire than females. These discoveries are not in concurrence with the discoveries of the current inves-

tigation. Akhtar (1996) [6] detailed that impact of period of birth was huge which was in agreement to the consequences of the current investigation. He revealed that impact of period of birth on pre-weaning weight acquire was huge as spring conceived sheep acquired better as contrast with pre-winter conceived sheep. Discoveries of Akhtar (1996) [6] with respect to the impact of sex and year of birth on pre-weaning normal every day acquire didn't expand the aftereffects of the current study, where as the perceptions in regards to impact of sort of birth and age of the dam on pre-weaning normal development rate validated the consequences of the current results. Qureshi et al (2010) [5] reported that station, year of birth, time of ewe, period of birth, sex and raising position were significant wellsprings of variation for pre-weaning every day acquire in Kajli sheep of Pakistan. These discoveries are not in accordance with the discoveries of the current analysis. He further revealed that sort of birth applied a non-significant impact on the trait. These discoveries are in concurrence with the consequences of the current investigation. Dixit et al. (2001) [6] study hereditary and non-hereditary effects on the body weight of 2425 Bharat Merino sheep sired by 154 rams more than 1982–1996. Year and period of lambing, sex of lamb, kind of birth, and time of dam and ewe weight were huge source of variation for lamb weight and every day gains. These outcomes were not in accordance with the discoveries of the current examination. Hussain (2006) [2] investigated 17250 family records of Thalli sheep with 17030 lambing kept up with at Livestock Experiment Station Rakh Ghulaman District Bhakkar, Pakistan during the period from 1975-2004. Gbangboche et al. (2006) [13] broke down information and announced non-hereditary elements influencing normal every day gains from 0 to 30 days, from 0 to 60 days, from 0 to 90 days and from 0 to 120 days. All proper impacts were significant for normal every day gains at 30 days. All decent impacts would in general counteract for weight and normal every day gains by 120 days. Sheep from ewes of third and fourth parity were heavier, with higher, normal every day gains. So these outcomes are not in concurrence with the discoveries of the current investigation.

5.7. Greasy Fleece Weight

The outcomes as gotten in the current study uncovered that extended time of birth, herd and sex of lambs significantly affected fleece weight, while period of birth and kind of birth had non significant impact on the attribute under investigation. Numerous analysts revealed the impact of natural variables on fleece yield in various breeds kept up with under various managemental conditions. Babar (1994) [10] study revealed that yearly fleece yield in Lohi sheep. It was likewise seen that time of shearing and age at shearing had huge impact on fleece yield. It was additionally reported that spring fleece wool yield in Lohi sheep, which was likewise affected by year of shearing and weight at shearing. It was additionally reported that difference yield contrasts because of season and age at shearing were non-significant. Akhtar (1996) [4] reported that the distinctions in grease fleece wool weight because of year of shearing were significant and non-significant impact of birth type. It was additionally in concurrence with the current research project. Qureshi et al (2010) [5] reported and observed that the change for yearly wool weight showed that due to time of shearing, age at shearing and sex were huge source of variation while birth type had a non-significant impact, this was in concurrence with the current study. Sinha and Singh (1997) [9] investigated information on Muzaffarnagri sheep and announced that the impacts of year of birth and sort of the board on first shearing fleece yield were all significant source of variation. Hussain (2006) [2] meticulous that the investigation of change for fleece yield uncovered that time of shearing, sort of birth and age at shearing significantly affected fleece weight. The above investigations were somewhat in concurrence with the current study. The yearly variation in the wool weight during various years demonstrated managemental just as healthful contrasts for nutrition as well. The increment in grease fleece weight with the headway old enough/equality might be credited towards expansion in body size with progression old enough. Clearly it could be because of reality that the male lambs were heavier and cumbersome than females at all ages.

6. Conclusion

Results showed that Kajli sheep breed could be improved on through selection and better management. This shows that ecological and environmental factors and variables can be controlled to achieve higher growth. Better administration and supplementation was huge wellspring of differentiations among flocks at different regions. These distinctions might be a result of typical supplementation of extent. These analyses were done utilizing DFREML PC programming software which is uncommonly intended for the assessment of fluctuation parts. These discoveries suggested that Kajli sheep can be improved by assurance and better management practice. Low assessment of the Kajli sheep and wide extent of phenotypic assortment in light of regular components suggested that improvement in empowering, parasites control and the administration, etc may further develop the advancement execution of Kajli sheep. It is moreover clear that improvement in performance of Kajli sheep may be cultivated through better uplifting and improved oversee managemental practices. The information and data so twisted will be eventually useful in developing future reproducing plans for hereditary improvement of Kajli sheep in Pakistan.

References

1. GOP. Economic Survey of Pakistan. Economic Advisor's Wing. Ministry of Finance, Government of Pakistan. Islamabad. 2011.
2. Hussain A. Genetic evaluation of Thalli sheep. Ph.D Thesis Univ. of Agri. Faisalabad Pakistan. 2006.
3. Harvey WR. User's Guide for LSMLMW (PC version) Mixed Model Least Square and Maximum Likelihood Computer Program, Ohio State University, Ohio USA. 2000.

4. Akhtar P. Genetic and phenotypic parameters of some performance characteristics of Hissardale sheep. Ph.D Thesis Uni. of Agric. Faisalabad Pakistan. 1996.
5. Qureshi MA, Babar ME, Ali A. Environmental and Genetic factors influencing Performance traits of Kajli sheep in Pakistan. Pakistan J. Zoology. 2010; 42(3): 339-343.
6. Dixit SP, Dhillon JS, and Singh G. Genetic and non-genetic parameter estimates for growth traits of Bharat Merino lambs. Small Ruminant Research. 2001; 42 (2): 101-104.
7. Akhtar P, Ahmad Z, Mohiuddin G, Ali S, and Javed K. Environmental factors affecting pre-weaning growth traits of Hissardale sheep in Pakistan. Pakistan. Vet. J, 2001; 21(1): 17-21.
8. Babar ME, Ahmad Z, Nadeem A, and Yaqoob M. Environmental factors affecting birth eight in Lohi sheep. Pakistan. Vet. J. 2004; 24 (1): 5-8.
9. Sinha NK, and Singh SK. Genetic and phenotypic parameters of body weights, average daily gains and first shearing wool yield in Muzaffarnagri sheep. Small Ruminant Research. 1997; 29(1-2): 21-29.
10. Baber ME. Genetic and phenotypic parameters of some performance characteristics of Lohi sheep. Ph.D Thesis Uni. of Agric. Faisalabad Pakistan. 1994.
11. Ali S, Hussain A, Akhtar P, Younas M, and Khan MA. Relationship of birth weight of lambs with age of ewes at service in Rambouillet sheep. Pakistan. Vet. J., 2006; 26 (4): 187-189.
12. Qureshi A. Genetic and environmental components of variation a performance traits of Kajli sheep in Pakistan. PhD Thesis Univ. of Agric. Faisalabad Pakistan. 1996.
13. Gbangboche AB, Youssao AKI, Senou M, Adamou-Ndiaye M, Ahissou A, Farnir F, et al. 2006. Examination of non-genetic factors affecting the growth performance of djallonke sheep in sudanian zone at the okpara breeding farm of Benin. J. Tropical Anim. Prod. Health. 2006; 38(1): 55-64.
14. Bathaei SS, and Leroy PL. Genetic and phenotypic aspects of the growth curve characteristics in Mehraban Iranian fat-tailed sheep. Small Ruminant Research. 1998; 29(3): 261-269.