HERITABILITY ESTIMATES OF WOOL PRODUCTION OF KACHHI SHEEP

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ABSTRACT: *In this research wool production record of Kachhi sheep breed reared at Haji Murad Khan Livestock Cattle Buffalo and Sheep Farm, Nabi Sar, Umar Kot, Sindh during 2000-X4 were utilized to determine the heritability estimates of wool production. The mean wool production at 1st, 2nd and 3rd shearing and combined production of 3 shearing and life time production in yield in new single born ewes were observed 2.56 ±0.034, 2.76±0.044, 2.87±0.34, 7.43±0.29, 9.35±0.276 kg, respectively. `Similarly, wool production at 1st and 2nd scaring and life time production were 2.56±0.086, 2.73±0.074, and 7.83±0.310 kg, respectively in twin born ewes. The heritability estimates of wool production at 1st, 2nd and 3rd shearing and the combined production of 3 shearing and life time production in single born ewes were observed 0.42±40.271, 0.258±0.250, 0.270±0.18, 0.057±0.01, 0.521±0.210, respectively. The heritability estimates for 1st and 2nd shearing life time production were observed 0.803 ±0.54, 0.117±0.33 and 0.411±0.43, respectively in twine born ewes.*

Keywords: Heritability, wool, Kachhi sheep

INTRODUCTION

There are 28 sheep breeds present in Pakistan. Variation exists among these sheep breeds; some are thin tail and fat tail. These indigenous sheep breed supply annually about 21.9% total meat produced and about 50.0 thousand tons of wool for carpet [1]. However, meat and wool production are comparatively low to which renders for sheep industry showing uneconomical [2]. It has also been recommended that improvement in quantity and quality of mutton and wool could be accomplished only through selective breeding or by crossbreeding with different exotic breeds such as Australian Corriedale and Awassi sheep [3]. Sindh is 2nd number thickly populated province of Pakistan possessing about 16% of the total sheep population [4]. Mostly sheep are reared because of their lower feed and money requirements as compared to large ruminants. They have small size, shorter interval and able to utilize a wide range of feedstuff [5]. The Kachhi breed of sheep is thin tail sheep breed commonly rear for mutton and wool purpose. Kachhi sheep are medium sized animals with white and brown body coat and legs [3]. This breed commonly found in the areas of Tharparkar and Ran of Katch to adjoining areas of Sindh province [6].

MATERIAL AND METHODS

The record of wool production of Kachhi sheep maintained at Haji Murad Khan Livestock Cattle Buffalo and Sheep Farm Nabi Sar Umar Kot, Sindh, during the year of 2010 to 2016 were maintained and brought at department of Animal Breeding and Genetics, Sindh Agriculture University, Tandojam for this study. The Farm condition regarding management, feeding and disease control were same as in winter and summer. Flushing of breeding lambs we restricted in autumn and it was practiced during breeding season and lambs were received during spring season. The shearing was performed once a year during 2010-2016 where after it was resorted again a year. The biannual records of wool production were standardized to annual basis through multiplying with 1.11394 factors. While the significant effect of year was minimized through deviating the adjusted record from respective mean of year. The wool production record of sheep's that having different types of birth were included separately for heritability estimation.

Following estimation of heritabilites was performed:

For single born lambs

Wool production at 1st shearing

Wool production at 2nd shearing

Wool production at 3rd shearing

Combined wool production for 3 shearing

Life time wool production

For twin born lambs

Heritability of both type of birth estimated through paternal half-sib correlation method. In this way each observed values were considered as having component as mentioned in below statistical model:

The heritability estimates were worked out using the half-sib correlation procedure and average progeny number was analyzed using the formula as suggested by [7]. While standard error of heritability were calculated by the formula as suggested by [8].

RESULT AND DISCUSSION

The average production of wool of 154 single and 575 twin born ewes at 1st, 2nd and 3rd shearing, the combined yield of 3 shearing and lifetime production is described in Table-1.As comparatively high estimation of wool production had been observed by [8]. Who reported in 1110 ewes of Wielkopolska ewes, average fleece weight at the age of 6 month was 3.23 kg for single born lambs and 3.12 kg for twin born lambs. The mention results at 12 month in 990 ewes were 6.13 and 6.21 kg.

Heritability estimates

The heritability estimates in single born sheep of wool production at 1st, 2nd and 3rd shearing and life time production are presented in Tabel-2. The heritability estimation was calculated from 158 half-sib of 13 sires was 0.413±0.181. Whereas lowest estimation of heritability was observed (0.011±0.016) for Awassi sheep has been reported by [9], [10], have been reported higher values of heritability (0.840±0.240). The estimation of heritability of wool production at 2nd shearing estimation for the data 154 half-sib of 13 sires was 0.253±0.25. The higher estimation of heritability estimates (0.50) were observed in Polish mountain sheep and comparatively low estimation of heritability estimates was (0.14±0.035) in Awassi sheep have

been observed by different researchers. The heritability estimates from 115 half-sibs of 11 sires at the time of 3rd shearing was 0.270±0.27. The heritability for lifetime production of wool was observed 0.432±0.21 from 154 half-sibs belonging to 13 sires Tabel-2. The higher heritability estimation was observed for 1st, 2nd, 3rd shearing and lifetime wool production for single horn sheep showed that higher phenotypic variation was due to heredity.

Table-1. The mean values and coefficient of variation wool production in single and twine born in Kachhi sheep

Traits	No. of observations	Mean ±ES	Range	C.V. %
Single born				
Wool production at 1st shearing	160	0.268± 0.46	0.82-5.15	21.0
Wool production at 2nd shearing	152	0.83±0 .014	1.14-4.71	21.0
Wool production at 3rd shearing	114	2.81±0 .055	1.16-4.42	24.36
Combined wool production of 3 shearing	114	7.42±0 .120	2.21-11.90	15.35
Lifetime wool production	152	10.34± 0.281	3.23-17.45	32.76
Twine born sheep				
Wool yield at 1st production	54	2.71±0 .072	1.25-3.10	18.24
Wool production at 2nd shearing	51	2.59±0 .0831	1.14-3.41	18.24
Lifetime wool production	51	7.82±0 .310	270-17.31	33.56

Table-2. Heritability estimates of wool production through paternal half-sib correlation procedure in single and twine born Kacchi sheep

Trait	Number of sire	Number of observations	Heritability ± SE
Single born ewes			
Wool production at 1st shearing	13	160	0.413±0.18
Wool production at 2nd shearing	13	152	0.258±0.15
Wool production at 3rd shearing	11	114	0.270±0.17
Combined wool production of 3 yield	11	152	0.057±0.01
Lifetime wool production		53	0.521±0.21
Twine born ewes			
Wool production at 1st shearing	5	53	0.803±0.54
Wool production at 2nd shearing	5	51	0.117±0.33
Lifetime wool production	5	51	0.41±0.43

It means that the environmental variance was observed quite low as compared to additive genetic variance, describing by better improvement in ewes as well as rams by the sue of superior sires.

Twine born sheep heritability estimates of wool production is based on 51 half-sibs of 5 sires at 1st and 2nd shearing along with lifetime wool production of 5 sires was observed 0.803±0.54, 0.218±0.33 and 0.411±0.43, respectively mentioned in Tabel-2. Above described higher estimation of heritabilites values in twine born Kacchi sheep suggest that selection of female for better wool production could be beneficial due to most of the observed variation showed due to additive genetic effect.

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