Comparative Study on Growth and Conformation of Male Dumbi Lambs under Two Management Systems

Huma Rizwana[1], Faizan Shahani[1], Rani Abro[3], Muhammad Naeem[1], Nasir Rajput[2], M.I. Memon[4], S.H. Abro[5], Hassina Baloch[6], H.K. Kunbhar[7], G.A. Mughal[1] and S. Shahzad Ali[8,*]

[1]Department of Livestock Management; [2]Department of Poultry Husbandry; [3]Department of Animal Nutrition; [4]Department of Veterinary Medicine; [5]Department of Veterinary Microbiology; [6]Department of Veterinary Microbiology; [7]Department of Animal Reproduction; [8]Department of Entomology Sindh Agriculture University, Tando Jam, Pakistan

Abstarct: A study was carried out on 12 male lambs of Dumbi sheep breed reared under two management systems at the Department of Livestock Management Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University Tando jam. The lambs of Dumbi breed were randomly divided into two groups i.e. group A and B (6 lambs in each group). The group A was reared under semi intensive management system (concentrate and open grazing) whereas animals in group B were kept under intensive management system (concentrate and green fodder). The experiment was lasted for (8) weeks and the observations for body weight and body conformation traits (girth, height and length) were recorded on weekly basis. The result indicated that the average body weight of lambs in group A (12.5 kg) was statistically higher (P<0.05) than lambs in group B (11.33 kg). Moreover, the average body conformation of Dumbi lambs of group A in respect of girth, height and length (56.83 and 40.5 cm, 41.5 cm respectively) were significantly higher than (P<0.05) the male Dumbi lambs of group B (55.33 and 39.33 cm, 40 cm respectively). While comparing the economical aspects of lambs reared under two management systems it was noted that the animals of group A were more economical (Rs.337 /lambs) compared to those of group B (Rs.245 /lambs).Result concludes that, the lambs reared under semi intensive management system (concentrate and open grazing) gained more body weight and body conformation than that of lambs reared under intensive management system (concentrate and green fodder).

Keywords: Management, intensive management, semi intensive system, Dumbi sheep, male lambs.

INTRODUCTION

Livestock raising is one of the biggest industry in Pakistan. The animals and products obtained from them contribute billions of rupees to the national economy each year. In the agriculture Livestock contribution value added stood at 55.9 percent while it contributes 11.8 percent to the national GDP during 2013-14 compared to 55.5 percent and 11.9 percent during the corresponding period last year, respectively. Gross value addition of livestock has increased from Rs. 756.3 billion (2012-13) to Rs. 776.5 billion (2013-14), showing an increase of 2.7 percent as compared to last year [1]. Sheep are small ruminants mainly kept for fleece and meat and rearly milk. Sheep contributes to food production, rural employment and gross national product by converting roughages into meat, milk and wool. There are 27 sheep breeds in Pakistan which are classified in to two major groups such as thin tail sheep fat tail sheep. The thin tail sheep breed included Damani, Kacchi, Kali, Kajli, Kooka and Lohi; while fat tail sheep breeds are Bibrik, Dumbi, Harnai, Pahari and Rakhshani. The sheep breeds originate in Sindh province are Dumbi, Kachhi and Kooka [2]. Dumbi breed originates from the mountainous area of south western Sindh comprising Dadu, Thatta and part of Karachi District. This area is popularly called “Mahal Kohistan”. The home tract of this breed further extends along the right bank of the Indus River of Larkana and Jacobabad Districts of Sindh and parts of Sibi District of Balochistan. Dumbi are medium-sized animals. Their bodies are white, and the face is black with occasional rings around the eyes. The small to medium ears some time has black spots. Most males are horned. Fore and hindquarters are moderately developed, and they have a medium sized tail. Adult males and females weigh 36 and 30 kg, respectively. Wool yield per head is 1.4 kg/anum. Fiber diameter is 38 µ. Dumbi sheep are raised for mutton and wool [3]. Dumbi sheep of Sindh have gained importance as a mutton breed. There is a dearth of information on the growth performance and feed requirements of the Dumbi breed under intensified production system. Universally, sheep are managed under three systems i.e. extensive, semi-intensive and intensive, on the contrary in developed world the most commonly practiced systems are semi intensive or intensive. The account of Dumbi breed available in the literature is very superficial. The characteristics of Dumbi breed are not studied in depth so for and for their production characteristics very little data is reported in the scientific literature. Thus keeping the

*Address correspondence to this author at the Department of Livestock Management, Pakistan; Tel: 03360880750;
E-mail: alisyedshahzad75@gmail.com

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above facts and importance of sheep farming in mind the hypothesis of the present study on growth and body conformation capabilities of fat-tailed sheep (Dumbi) was undertaken under two management systems viz; semi intensive and intensive. Thus, the aim of this study was to determine the growth and confomation of male Dumbi lambs under two management systems. So that proper management system could be suggested for better sheep production.

MATERIAL AND METHOD

Grouping and Rearing of Sheep Lambs

Twelve male lambs of Dumbi breed (2 months age) were experimented under two management systems at Livestock Experimental Station, Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University Tando jam. To achieve the objectives of the study all the lambs were tagged and physically examined for their normal health and activeness. The animals were reared in two separate pens six lambs in each pen were grouped as:

1. Group-A Dumbi lambs having tag numbers DL1, DL2, DL3, DL4, DL5 and DL6 were reared under semi-intensive management system i.e. they were permitted for grazing and concentrate ration was provided at animal shed.

2. Group-B Dumbi lambs having tag numbers, DL7, DL8, DL9, DL10, DL11 and DL12, were kept under intensive management system at Livestock experimental station i.e. without grazing; they were fed on green fodder and concentrate ration. The green fodder and water were provided ad libitum. The experimental lambs were reared for the period of 8 weeks.

Formulation of Concentrate Ration

Concentrate ration was formulated on the basis of 70% TDN and 12% CP.

Adaptation Period of Lambs

All the lambs in each group were kept under adaptation period for 10 days and the age of lambs in both groups (A and B) was also recorded.

Weight of Dumbi Sheep Lambs

Before starting actual experiment the initial weight of lambs was recorded through weighing Balance. Thereafter, weekly observation up to eight weeks on the body weight was noted.

Measurement of Body Conformation of Dumbi Sheep Lambs

The initial body conformation in respect of height, girth and length was taken through plastic tape measure (Goldenfish Brand China). The height of lambs were measured from wither up to the end of hoof. The girth was taken as circumference of chest just behind the elbow. The lengths of lambs were measured from shoulder point up to the end of pin bone. Thereafter, weekly observation up to eight weeks on the body conformation (height, girth, and length) of both groups (A and B) were taken.

Economics

For the purpose of economics evaluation of the animal purchasing cost, feed cost, medication cost, labor charges and miscellaneous cost were recorded. The profit or loss margin was compared in both groups.

Statistical Analysis

The data so obtained was tabulated and analyzed statically by applying compeletely randomized design (CRD) by using MSTAT-C Computer Package.

RESULTS

In order to examine the body growth and conformation of Dumbi male lambs under different management systems, the experiment was conducted during the year 2014 at the Livestock Experimental Station, Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University Tando jam. The lambs in group A were kept under semi intensive management system (Concentrate + grazing); while lambs in group B were kept under intensive (Concentrate + green fodder) management system. The body growth and conformation of all the experimental lambs was examined and statistically analyzed.

Initial Body Weight

The initial body weight of Dumbi male lambs was recorded before the start of experiment (Table **1**) average initial body weight was 8.25 kg in group-A and 8.17 kg in group-B.

Body Weight

The body weight of Dumbi male lambs was recorded for a period of 8 weeks and results (Table **2**) indicated that the lambs under semi-intensive

Table 1: Initial Body Weight (kg) of Male Lambs of Dumbi Breed under Two Management Systems

Group A		Group B	
Tag no	**Weight**	**Tag no**	**Weight**
DL 1	8.25	DL 7	8
DL 2	8.5	DL 8	8.5
DL 3	8	DL 9	8.25
DL 4	8	DL 10	8
DL 5	8.5	DL 11	8.25
DL 6	8.25	DL 12	8
Total	49.5	Total	49
Mean	8.25	Mean	8.17

management system they were allowed for grazing and concentrate ration was provided at animal shed (group-A) However at the end of experiment, the average body weight of lambs of group A kept under semi-intensive management system was higher (12.5 kg) than group B those under intensive management system (11.33 kg). The results statistically showed that the differences between body weight under both management systems were significant (P<0.05).

Table 2: Average Body Weight (kg) of Male Lambs of Dumbi Breeds under Two Management Systems

Weeks	Group-A	Group-B
1	8.58	8.42
2	9.13	8.88
3	9.63	9.21
4	10.13	9.46
5	10.67	9.88
6	11.17	10.38
7	11.75	10.88
8	12.5	11.33

BODY CONFORMATION

Body Girth (cm)

The body girth of Dumbi male lambs was measured for a period of 8 weeks and the results are presented in Table **3**. After the complitition of experiment, the average body girth of lambs under semi management system reached to 56.83 cm as compared to those kept under intensive management system 55.33 cm. The results indicated that the lambs reared under semi-intensive management system (group-A) got greater body girth than lambs of group B reared under intensive management system. It was further noted from the comparative results that statistically the differences between body girth as affected by management system as well as weeks of observation were significant (P<0.05).

Table 3: Average Body Girth (cm) of Male Lambs of Dumbi Breed Reared under Two Management Systems

Weeks	Group-A	Group-B
1	50.83	50.50
2	51.67	51.33
3	52.50	51.67
4	53.25	52.33
5	54.17	53.00
6	54.83	53.67
7	55.83	54.50
8	56.83	55.33

Body Height (cm)

The body height of male Dumbi lambs in each group was measured for a period of 8 weeks and the results are presented in Table **4**. After the complitition of experiment, the average body height of lambs under semi management system reached to 40.5 cm as compared to those kept under intensive management system 39.33 cm. The result indicated that the male Dumbi lambs reared under group-A (semi-intensive management system) obtained greater body height than group B reared under intensive management system. It was further noted from the comparative results that statistically the differences between body height as affected by management systems was significant (P<0.05).

Body Length (cm)

The weekly data were recorded on the body length of Dumbi male lambs in each group and the average

results are indicated in Table **5**. At the end of experiment, the average body length of lambs under semi management system reached to 41.5 cm as compared to those kept under intensive management system (40 cm). The results showed that the male Dumbi lambs kept under semi-intensive management system (group-A) resulted greater body length, and average than (group-B) reared under intensive management system. The results further showed that statistically the differences between body length as affected by management system was significant (P<0.05).

Table 4: Average Body Height (cm) of Male Lambs of Dumbi Breed Reared under Two Management Systems

Weeks	Group-A	Group-B
1	34.00	33.83
2	34.92	34.42
3	35.75	35.00
4	36.67	35.58
5	37.58	36.58
6	38.25	37.42
7	39.25	38.33
8	40.5	39.33

Table 5: Average Body Length (cm) of Male Lambs of Dumbi Breed Reared under Two Management Systems

Weeks	Group-A	Group-B
1	36.58	36.50
2	37.00	36.83
3	37.75	37.50
4	38.33	37.83
5	39.08	38.50
6	39.75	38.83
7	40.67	39.33
8	41.5	40

Economics of Male Dumbi Lambs

After completion of eight weeks experimental trial the lambs were sold and on the basis of their sale value the economics of the project was worked out and the results are presented in Table **6**. Each lamb of group A was given 250 g of concentrate ration and allowed open grazing 8 hours in a day and each lamb of group B was given 250 g concentrate ration and 2 kg green fodder daily. On accumulation of the production costs including initial purchase price of lambs, the total costs were Rs. 3688 and 3705 on lambs of group A and B, respectively. The lambs in group A were sold at the average prices of Rs. 4025, while lambs of group B were sold at the average price of Rs. 3950. After deduction of total costs from the total sale value of the average lamb, the average net profit for lambs of group A was Rs.337 and, while net profit from lambs of group B was Rs. 245. It was concluded that among management systems, semi-intensive management, in which Dumbi lamb were fed concentrate ration at the animal shed and green fodder during grazing produced remarkably higher net profit than the lambs of intensive management system, fed similar concentrate ration and green fodder under the shed with the exception of grazing.

Group A (semi intensive system): Lambs fed 250g concentrates daily at the animal shed + grazing. Group B (intensive system): Lambs fed concentrates + green fodder at animal shed i.e.; without grazing.

DISCUSSION

Body Weight

In the present study it was noted that male Dumbi lambs in group A reared under semi-intensive management system gained significantly (P<0.05) higher final body weight (12.5 kg) as compared with lambs in group B reared under intensive system (11.33 kg). The results of this study are fully supported by Johnson and McGowan [4] who reported that semi-intensive system did improve live and slaughter weights and increase dressing percentages. Herrera *et al.* [5] reported that kids in semi-intensive and extensive system grew faster than intensive system. The current study has agreement with Paramasivam *et al.* [6], Alvarez-Rodriguez *et al.* [7] and Barham *et al.* [8] they reported that body weight increased significantly in semi-intensive management system than intensive management system.

Body Conformation

In current study the body girth of male Dumbi lambs in group A reared under semi-intensive management system was higher (56.83 cm) and lambs in group B reared under intensive system (55.33 cm). It is

Table 6: Economics of Male Lambs of Dumbi Breed Reared under Two Management Systems

Sr. No.	Particulars	Groups	
		A	B
1	Per animal feed consumption in 8 weeks (kg)	126	126
2	Concentrate (kg/per animal)	14	14
3	Rate of concentrate (Rs/kg)	32	32
4	Amount of concentrate (Rs) 2 x 3	448	448
5	Quantity of green fodder (kg/animal) 1 – 2	112	112
6	Rate of green fodder (Rs/kg)	3.5	3.5
7	Amount of green fodder (Rs/animal) 5 x 6	392	392
8	Total feed cost/animal (Rs) 4 + 7	840	840
9	Cost medication/vaccination (Rs)	48	75
10	Labour cost (Rs)	210	170
11	Misc. cost (Rs)	110	140
12	Initial cost of lambs (Rs/lamb)	2480	2480
13	Total Costs (Rs)	3688	3705
14	Weight gain/lamb in 8 weeks (kg)	2.29	1.80
15	Initial weight/lamb (kg)	6	5.96
16	Total weight (kg/lamb)	8.29	7.75
17	Sale of animal (Rs/lamb)	4025	3950
18	Net profit 17 – 13	337	245

accordance with the finding of Ravimurugan *et al.* [9] who reported that chest girth is the best predictor for the estimation of body weight and this alone contributed 69.1 per cent variation in the body weight of adult Kilakarsal sheep. Shaba and Zubairu [10] found that heart girth was the most appropriate and confident parameter in live weight estimations for sheep and goats. Musa *et al.* [11] and Iqbal *et al.* [12] they found that the considerable variation in body girth and other body conformation traits in different goat breeds under different feeding and management systems.

In the present study the body height of lambs reared under semi- intensive management system was higher (40.5 cm) than the lambs reared under intensive management system (39.33 cm) and body length of lambs reared under semi-intensive system (41.5 cm) was higher as compared to lambs reared intensive system (40 cm). These results are in resemblance with the findings of Ravimurugan *et al.* [9] they reported that the height at withers, body length, heart girth, paunch girth, face length, ear length, tail length and body weight of Ramnad white sheep were 74.22±0.71, 66.82±0.87, 81.65±0.82, 72.43±1.15, 24.35±0.74, 12.79±0.28, 7.84±0.25 cm and 31.05±0.57 kg respectively. . The figure in present study are in accordance with Barham *et al.* [8] they concluded that the weight gain and body conformation was more in male Kooka and Kachhi lambs under semi-intensive management system as compared to intensive management system. According to Iqbal *et al.* 2013 Body length, withers height and heart girth were found to be best fit accounting for 70 % of the live body weight.

Economics of male Dumbi lambs

In the current study when economically analysed the net profit obtained under semi-intensive management system was higher (Rs.337/lamb) as compared to lambs of the same breed kept under intensive management system (Rs.245/lamb). The current findings agreed with Patel *et al.* [13] they reported higher incremental return per goat/year was Rs 235.9 (Marwari goat) and Rs 226.3 (Parbatsari goat) in semi-intensive system and comparative lower incremental return per goat/year was observed in

intensive system (Rs 188.2 and Rs 108.2 for Marwari and Parbatsari goats, respectively). Where as Patel *et al.* [13] described that economic analysis of extensive, semi-intensive and intensive systems revealed that total return were maximum in intensive management system but input cost was also high in this system, therefore, the net return was more in semi-intensive system. According to Paramasivam *et al.* [6] semi-intensive system was beneficial for rearing of Barbari goats. Where as Patel *et al.* [13] described that economic analysis of extensive, semi-intensive and intensive systems revealed that total return were maximum in intensive management system but input cost was also high in this system, therefore, the net return was more in semi-intensive system.

CONCLUSION

It was concluded that the male Dumbi lambs reared under semi-intensive management system were resulted higher body weight than those reared in intensive management system. Semi-intensive management system showed better body conformation (girth, height and length) in male Dumbi lambs. The lambs that were allowed grazing and concentrate ration revealed better performance. Economically, rearing of male Dumbi lambs under semi-intensive management system was more profitable than intensive management system. And the comparative studies on sheep lambs and goat kids should be conducted for fattening trait to investigate the weight gain and conformation between them.

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