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## Growth performance of osmanabadi goats under different feeding methods

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#### Abstract

The present experiment was carried out for 90 days (3 months) on either sex 72 Osmanabadi goat kids from 16 April 2017 to 15 July 2017 at COVAS, Udgir. The experimental parameters for the present study were T<sub>0</sub> - 8 Hrs Grazing + Concentrate (@ 2% of live body weight : 50% at Morning + 50% at Evening), T<sub>1</sub> - 4 Hrs Grazing + Hanging bunches of Dry Grass & Green + Concentrate (@ 2% of live body weight : 50% at Morning + 50% at Evening), T<sub>2</sub> - 4 Hrs Grazing + Chaffed Dry Grass & Green + Concentrate (@ 2% of live body weight : 50% at Morning + 50% at Evening), T<sub>3</sub> - 4 Hrs Grazing + Individual feeding (Dry+ Green+ Concentrate) (@ 2% of live body weight : 50% at Morning + 50% at Evening). Body parameters were Weekly height at wither, Weekly growth in chest girth, Weekly growth in body length, the overall average Body weight gain recorded for the goats of all prescribed age groups for Control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 3.36, 6.89, 5.12 and 4.04 kgs respectively. In Osmanabadi goats, grazing alone cannot meet the nutritional demand of body, hence malnourishment is the common problem in extensive goat rearing. Overall growth performance in Osmanabadi goat is enhanced by offering *adlib* green fodder with supplementation of concentrate mixture @ 2% of live weight after 4 hours of range grazing.

**Keywords:** Common problem, peninsular region, comprising

#### Introduction

Osmanabadi goat breed is one of the most popular goat breed of the arid and semi-arid region of Maharashtra. This breed derived its name from Osmanabad district of Maharashtra and meat production is an important character of this breed. These Goats are reared mainly in 3 southern states of India and are one of the largest contributors to meat production in southern India. The breed is spread over the greater part of the central peninsular region, comprising the semi-arid areas of Maharashtra, Andhra Pradesh and Karnataka. It covers the Major part of Southern Maharashtra (especially Osmanabad, Beed, Solapur, Latur, Parbhani and Ahmed Nagar Districts) Western Andhra Pradesh and North Eastern Karnataka. Goat is a well-adapted livestock species for grazing and browsing, feeding through different sized mangers and confined stall feeding is the most common management followed by goat farmers. Considering the natural feeding habits of goats, it seems to be somewhat uncomfortable with advanced feeding methods. Feeding satisfaction surely reflects its impact in production potential of animals. Hence the hypothesis was laid to access the effect of different feeding methods on the performance of Osmanabadi goats.

Nowadays, Commercialisation of goat rearing has introduced stall feeding practices for goats, but considering the natural browsing habit of goats. The drastic change in feeding method may have some impact on general health of the goats. The hypothesis of the present investigation was this is that, modification in the existing feeding methods in view to provide natural arrangements of feed resources will surely improve the performance of goat under semi intensive system of goat rearing.

To work out the precision for future modifications in feeding management of the Osmanabadi goats, present study had been designed.

#### Materials and Methods

The present experiment was carried out for 90 days (3 months) on either sex 72 Osmanabadi goat kids from 16 April 2017 to 15 July 2017 at COVAS, Udgir.

The experimental parameters for present study were T<sub>0</sub> - 8 Hrs Grazing + Concentrate (@ 2% of live body weight : 50% at Morning + 50% at Evening), T<sub>1</sub> - 4 Hrs Grazing + Hanging bunches of Dry Grass & Green + Concentrate (@ 2% of live body weight : 50% at Morning + 50% at Evening), T<sub>2</sub> - 4 Hrs Grazing + Chaffed Dry Grass & Green + Concentrate (@ 2% of live body weight : 50% at Morning + 50% at Evening), T<sub>3</sub> - 4 Hrs Grazing + Individual feeding (Dry+ Green+ Concentrate) (@ 2% of live body weight : 50% at Morning + 50% at Evening). Body parameters were Weekly height at wither, Weekly growth in chest girth, Weekly growth in body length, The differences among the treatments within the experiment were determined by the data generated, using Factorial Randomized Block Design.

**Results and Discussion**

The results of the growth performance of Osmanabadi goats like Weekly height at wither, Weekly growth in chest girth, Weekly growth in body length, and Weekly weight gain are presented and discussed as below.

**Table 1:** Overall Average Growth in Chest Girth (Cms)

Age Group (Months)	Average Readings (Cms)	Treatment Groups			
		Control	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
06-12	Initial	41.33	41.00	38.83	40.67
	Final	48.05	52.55	45.63	46.27
	Total Growth	6.72	11.55	6.80	5.60
13-18	Initial	51.83	51.33	53.67	52.83
	Final	58.55	60.78	61.60	58.50
	Total Growth	6.72	9.45	7.93	5.67
19-24	Initial	60.33	66.67	68.83	67.50
	Final	67.52	75.08	77.10	74.20
	Total Growth	7.18	8.42	8.27	6.70
Overall Average Growth (Cms)		6.87	9.80	7.66	5.99

The average chest girth in Osmanabadi goats observed that there was positive linear correlation between the size of chest girth and the age of goat in all the treatment groups. During the experiment it was prominently observed grazing supplemented with stall feeding enhances the growth in goat. The results generated to the overall average growth recorded for goats of all prescribed age groups for Control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 6.87, 9.80, 7.66 and 5.99 cms respectively. The results obtained were significantly differed in concurrence to the treatments applied.

Ahmad *et al* (2014)<sup>[1]</sup> reported the accelerated performance of Beetal goats kids supplemented with concentrate mixture @ 2% of live weight. The findings of present investigation were principally similar to his conclusion.

Highest growth was observed in treatment group T<sub>1</sub> fed with hanging bunches of fodder, which proved that feeding of goats by its most natural mean of feeding habit accelerates the performance of physical growth in goats.

The findings for the improvement in average chest girth in stall fed goats are in close agreement with Bharambe and Burte (2011)<sup>[5]</sup> revealed that, the sustainable lamb production could be promoted in stallfed (Intensive) system. The average measurements for chest girths at different age groups are in close association with the findings and average body measurements recorded by Kumar *et al* (1992)<sup>[15]</sup> Shinde (2000)<sup>[26]</sup>, Das *et al* (2002)<sup>[10]</sup>, Mandakmale (2002)<sup>[16]</sup>, Banait *et al* (2002)<sup>[4]</sup>, Raskar (2008)<sup>[24]</sup>, Nikam *et al* (2012)<sup>[20]</sup>, Ahmad Fahim *et al* (2013)<sup>[1]</sup>. The deficient performance of goats maintained on sole grazing was concluded due to their incomplete feeding on pasture, this conclusion are in close agreement with Chaturvedi *et al.* (2012)<sup>[7]</sup> concluded that the ewes grazing on community rangelands were not able to meet their nutrient requirements

**Table 2:** Overall Average Growth in Body Length (Cms)

Age Group (Months)	Average Readings (Cms)	Treatment Groups			
		Control	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
06-12	Initial	41.17	44.83	41.50	31.36
	Final	48.67	57.00	53.00	46.50
	Total Growth	7.50	12.17	11.50	14.64
13-18	Initial	50.50	47.50	53.00	49.67
	Final	57.83	59.00	63.50	56.83
	Total Growth	7.33	11.50	10.50	7.17
19-24	Initial	57.67	56.33	55.67	61.83
	Final	65.67	67.17	65.33	70.50
	Total Growth	8.00	10.83	9.67	8.67
Overall Average Growth (Cms)		7.61	11.50	10.56	10.16

The overall average growth in body length was recorded for 6-12 months as 7.50, 12.17, 11.50 and 14.64, for 13-18 months as 7.33, 11.50, 10.50 and 7.17 and for 19-24 months age group as 8.00, 10.83, 9.67 and 8.67 cms for Control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> respectively.

Overall, highest growth in body length during the present investigation was recorded for T<sub>1</sub> treatment group followed by T<sub>2</sub>, T<sub>3</sub> and Control.

The average growths observed are in close association with the findings of Das *et al* (2002)<sup>[10]</sup>. Ahmad *et al* (2014)<sup>[2]</sup> were also reported that the kids on three times adlib feeding green fodder supplemented with concentrate mixture @ 1% of body weight performed well in terms of body measurements. From the above discussion, it is concluded that, feeding of Osmanabadi goats by means of hanging bunches of green fodder with supplementation of concentrate mixture @ 2% body weight along with 4 hours grazing enhances its growth

performance.

**Table 3:** Overall Average Growth in Height at Wither (Cms)

Age Group (Months)	Average Readings (Cms)	Treatment Groups			
		Control	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
06-12	Initial	41.17	40.67	38.83	39.83
	Final	47.83	50.33	46.00	45.67
	Total Growth	6.66	9.67	7.17	5.84
13-18	Initial	52.00	51.00	53.17	52.67
	Final	58.33	60.33	62.33	58.67
	Total Growth	6.33	9.33	9.17	6.00
19-24	Initial	59.83	66.50	69.17	67.00
	Final	67.50	74.83	76.83	74.00
	Total Growth	7.67	8.33	7.67	7.00
Overall Average Growth (Cms)		6.88	9.11	8.00	6.28

It was observed that, the overall average growth in height at

withers at 6-12, 13- 18- and 19-24-months age group were 6.66, 9.69, 7.19 and 5.84; 6.33, 9.33, 9.17 and 6.00 and 7.67, 8.33, 7.67 and 7.00 for Control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> treatment groups respectively.

Consistently it was observed that, treatment group T1 exhibited superior growth performance among all the treatment groups.

The observations recorded for height at withers for 19-24 months of age group for Osmanabadi goats of either sex were in close agreement with the report of, Shinde (2000) [26] who reported average height at withers in Osmanabadi goat as 69.34±0.22 cms for above 12 months of age. However the findings under present investigation were more than the least square means for height at withers of Sangamneri goats under field conditions reported by Patil *et al.* (2013) [21].

**Table 4:** Overall Average Growth in Height at Hip (Cms)

Age Group (Months)	Average Readings (Cms)	Treatment Groups			
		Control	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
06-12	Initial	43.50	43.33	41.00	42.67
	Final	50.00	53.97	48.20	49.23
	Total Growth	6.50	10.63	7.20	6.27
13-18	Initial	54.00	53.35	55.20	55.50
	Final	61.08	62.65	64.45	62.70
	Total Growth	7.08	9.30	9.25	7.20
19-24	Initial	62.17	67.17	71.50	69.83
	Final	70.05	77.92	79.75	78.32
	Total Growth	7.88	10.75	8.25	8.48
Overall Average Growth (Cms)		7.15	10.23	8.23	7.42

During the experiment it was prominently observed that, grazing supplemented with stall feeding enhances the growth of goat. The overall average growth recorded for height at hip of all prescribed age groups for Control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 6.50, 10.63, 7.20 and 6.57 cms respectively. The results obtained were significantly differed in concurrence to the treatments applied.

The results reported by the Chaturvedi *et al.* (2010) [6], Ahmad *et al.* (2014) [2] in regards to the improvement in different body measurement as supplemented feeding with adlib green fodder was in agreement with the results obtained in present study.

The findings for the improvement in average height at hip in stall fed goats are in close agreement with Bharambe and Burte (2011) [5] revealed that, the sustainable lamb production could be promoted in stallfed (Intensive) system. The average measurements for chest girths at different age groups are in close association with the findings and average body measurements recorded by Kumar *et al.* (1992) [15] Shinde (2000) [26], Das *et al.* (2002) [10], Mandakmale (2002) [16], Banait *et al.* (2002) [4], Raskar (2008) [24], Nikam *et al.* (2012) [20], Ahmad Fahim *et al.* (2013) [1].

**Table 5:** Overall Average Daily Fodder Intake (Gms)

Age Group (Months)	Treatment Groups		
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
06-12	742	184	249
13-18	830	286	333
19-24	917	468	468
Overall Average Intake (Gms)	830	313	350

The overall average daily fodder intake observed for 6-12, 13-18 and 19-24 months were recorded as 742, 184 and 249 gms for treatment T1, 830, 286 and 333 gms for T2 and 917, 468 and 468 gms for T3. The overall observations for average

daily fodder intake was summarized as the overall average daily fodder intake in Osmanabadi goat grazed for 4 hours and supplemented with concentrate mixture @ 2% of live body weight were 830, 313 and 350 gms per day for treatment T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> respectively.

The highest intake was observed in treatment group T1 fed with hanging bunches of green fodder. There was highly significant difference in fodder intake of T1 and other treatment groups.

The results obtained were in close agreement with the findings reported by Kabir *et al.* (2002) [13], Raghuvansi *et al.* (2007) [23], Singh and Singh (1986) [27] who revealed intake of 2.70 kg/100 kg body weight in stall feeding goats; however the findings of the present investigation were not in agreement with the report of Das and Joshi (1986) [9] who revealed that there was no increase in herbage intake beyond 4 hours of grazing. However, the general trend of increasing fodder intake with advancing age was in agreement with the findings reported by El Fadil (1995) [12] with average feed intake by desert goats are found to be less than the observations recorded in present investigation, however, are in close association with Moniruzzaman *et al.* (2002) [18].

As far as the positive correlation between average fodder intake and accelerated growth in all parameters studied in present investigation is concerned, the findings recorded by Skarpe and unfolded the hidden truth about herbivorous that the productivity escalates with digestible energy intake. Same observations were also revealed by Kenedy and Milligan (1987) [14] and Morand-fehr and Sauvant (1987) [19].

Lowered fodder intake observed in T<sub>2</sub> and T<sub>3</sub> treatment groups it was observed that, goats fed through the mangers or the plastic trough refuses the feed after few days if fed on the same place. This might be due to the offensive smell derived from such common places, the conclusion is in close association with Preston and Leng (1987) [22].

In treatment group T<sub>3</sub> fed individually fodder intake was lowest, this fact gives certain clues about study the impact of individual versus group feeding. In present investigation it was apparently concluded that, the social behavior of goat includes group feeding, it needs future research in this regard specifically.

**Table 6:** Overall Average Gain in Body Weight (Kgs)

Age Group (Months)	Average Readings (kgs)	Treatment Groups			
		Control	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
06-12	Initial	11.96	15.37	11.50	11.68
	Final	14.01	21.37	14.31	13.48
	Total Growth	2.06	6.00	2.81	1.79
13-18	Initial	16.66	14.85	15.39	16.25
	Final	19.50	21.78	21.67	20.57
	Total Growth	2.84	6.93	6.29	4.32
19-24	Initial	22.10	20.77	22.32	20.48
	Final	27.28	28.52	28.59	26.49
	Total Growth	5.18	7.75	6.27	6.01
Overall Average Growth (kgs)		3.36	6.89	5.12	4.04

In Osmanabadi goats, it was observed that there was positive linear correlation between the Body weight and the age of goat in all the treatment groups. During the experiment it was prominently observed that, grazing supplemented with stall feeding enhances the growth of goat. It was noted that, the overall average Body weight gain recorded for the goats of in all prescribed age group for Control, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were 3.36, 6.89, 5.12 and 4.04 kgs respectively.

From the obtained results it was cleared that, there was



positive linear correlation of Body weight with age in Osmanabadi goats. The findings were in close agreement with the analysis reported by Badi *et al* (2002)<sup>[3]</sup>, Chobtang *et al* (2009)<sup>[8]</sup>.

Ahmad *et al.* (2014)<sup>[2]</sup> also reported the accelerated performance of Beetal goats kids supplemented with concentrate mixture @ 2% of live weight. The findings of present investigation were principally similar to his conclusion.

The findings for the improvement in average Body weight in stall-fed goats are in close agreement with Devendra and Burns (1983)<sup>[11]</sup>. The goats of Control group fed on grazing only exhibited the lowest body weight gain during the entire period of the experiment, the observation is in close agreement with the report of Saini *et al.* (1988)<sup>[25]</sup>. However the body weight gain was found with a positive linear correlation with age of the animal, the observations in this regard was not in association with the findings of Mishra and Ghal (1990)<sup>[17]</sup> reported that body weight declines as age advances

### Conclusion

In Osmanabadi goats, stall feeding by means of hanging bunches of green as well as dry fodder is the most economical and comfortable method of feeding management. Overall growth performance in Osmanabadi goat is enhanced by offering *adlib* green fodder with supplementation of concentrate mixture @ 2% of live weight after 4 hours of range grazing. In Osmanabadi goats, grazing alone cannot able to meet the nutritional demand of the body, hence malnourishment is a common problem in extensive goat rearing.

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