

## STUDIES ON BODY MEASUREMENT AND PRODUCTIVE PERFORMANCE OF GOAT IN SADAK ARJUNI TAHSIL OF GONDIA DISTRICT

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### ABSTRACT

The present investigation entitled “Studies on body measurement and productive performance of goat in SadakArjuni tahsil of Gondia district” was undertaken in SadakArjunitahsil of Gondia district of Vidharbha region of Maharashtra state during the year 2017-2018. Four villages viz., Tidka, Sawangi, Bamhani and Kohlitola were randomly selected. The observations were recorded on 2000 local goat comprising different number of goats from each flock were observed for physical characteristics and lactation performance. The data were categorized according to flock size viz., small flock, medium flock and large flock. It was found that local goats reared in SadakArjuni tahsil are medium size with predominantly brown mixed with black or white in colour, convex forehead, straight horn in backward direction, pendulous ear and medium tail. Majority of local goats did not have wattles and beard. Mostly, brownish eye colour found in local goats. The 64.15% were convex forehead with average head length ranging from 15.03 cm to 15.56 cm. Horn pattern in maximum goats were straight backward and average length ranging from 7.12 cm to 8.17 cm. The ear orientation in 100 per cent goat found to be pendulous and maximum ear length recorded in local goat in both sexes i.e. 18 cm in male and 16 cm in female. The average length of neck and neck circumference ranging between 22.14 to 27.84 cm and 24.61 to 29.01 cm, respectively in adult goat. In body measurements, maximum average body length (67.50 cm in male and 64.50 cm in female), chest girth (65.46 cm in male and 64.50 cm in female), height at wither (64.50 cm in male and 63.51 cm in female) were observed in adult local goats. The body weight of local goats ranged between 20.07 to 26.21 kg. The average daily milk yield day<sup>-1</sup> was 469 g day<sup>-1</sup> with lactation period of 132 days.

(Key words: Phenotypic characterization, body measurements, productive performance, local goat)

### INTRODUCTION

India possesses largest bovine population of 190.9 million cattle and 108.7 million buffalo (19<sup>th</sup> Livestock Census). World's current population of goat is around 921 million of which India possess 135.1 million goats which comes to about 14.66 per cent of world population and the country ranks second after China in goat population. The goat population of Maharashtra is 8.43 million which contributes to 6.24% of the Indian's goat population (Anonymous, 2012).

Goat is one of the important small ruminants which have been domesticated by man since time immemorial. Archaeological evidences indicate that goat was one of the first animals to be domesticated at the dawn of Neolithic period in the fertile crescent by humans around 10,000 years ago (Porter, 1996 and Pringle, 1998). The wild Bezoar (*Capra aegagrus*) was reported to be the present day goats (Joshi, 2004).

Goats are multi-purpose animals, producing meat, milk, hide and fiber. Goat meat is relished in all countries of Asia, Africa and Middle East. Goat is the major supplier of meat, thus, there is a considerable potential for developing goat production for meat for internal consumption. Goat farming is one of the important agricultural enterprises particularly in rural parts of this country and have proved very useful to man throughout the ages, largely because of their adaptability to varying environmental conditions. They have tremendous ability to survive, and often thrive on sparse vegetation unsuitable for feeding of other livestock. The majority of this poorer section of rural population depends on goat rearing for income and certain amount of meat and milk for home consumption. Goat rearing requires low cost and hence, suited to landless laborers, marginal farmers and industrial workers.

Goats are ideal for mixed species grazing. Goats can very well thrive under zero inputs and have been rightly quoted as “poor man's cow” by Mahatma Gandhi. The marginal and landless farmers in India regard goat as “poor

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man's cash crop". Under proper management, goats can improve and maintain grazing land reduce bush encroachment, without any harm to environment. Goat creates employment to rural poor by effectively utilizing unpaid family labour.

The goat a minicow is a multipurpose animal to provide meat, hide, hair (fur) and manure for soil. In hilly areas goats are also used for hauling light load. Now in rural area goat farming plays a vital role to solve unemployment. The famous Kashmiri shawl is prepared from Pashmina goat's hair (fur) and world famous glossy kid skin is available from Black Bengal goat. Goats play an important role in income generation, capital storage, employment generation and improving household nutrition. Being smaller in size they are easier to manage, require less space and can be easily handled by women and children.

Chevon has no religious taboos hence, is consumed by people of all the religions and races in India. Goats are rightly considered as gold, which can be encashed by their keepers at any time of the year. Goat is principle source of animal meat in the world contributing about 544,000 tones meat annum<sup>-1</sup> (Anonymous, 2008). The goat rearing also generates about 5% rural employment and about 20 million families belonging to landless, small, marginal labourers are engaged in goat keeping. In India, goats are generally reared by professional breeders, especially nomadic tribes, who have limited resources to maintain the goats. They are mostly dependent on scarce browsing materials like shrubs, bushes, pods, hard and thorny vegetation, which grow naturally on waste pasture/range land; including foliage of neem, babul, kheri, grasses etc. (Ramod, 2015).

Out of 23 goat breeds, four are present in Maharashtra viz., Osmanabadi, Sangamneri, KokanKanyal and Berari. Goat milk being rich in immunoglobulin has high medicinal value. Goat keeping is an insurance against all types of natural hazards like drought, famine, floods etc. Goats can sustain themselves in arid, semi-arid, hilly, heavy rainfall and tribal areas where they survive on sparse forage and extreme climate conditions more comfortably than the other species (Boyazoglu and Fehr, 1987). There is a famous saying in Rajasthan that "Ooni chore aakronbakrina chore kaankron" which means that camel does not eat aak, but the goat eats everything even the small stones.

Breed is usually described on the basis of subjective evaluation of limited data obtained from organized herds. Characterization or evaluation of breeds depends on detailed study of factors such as the native breeding involvements, morphological description, adoption of environmental practices and utilities. Geographical and demographical distributions have also to be worked out to asses economic contribution and need for conservation.

In Vidarbha there are three agro-climatic zones under dry farming system where agriculture produce is unpredictable. Most farmers and landless labourers keep livestock besides agriculture. But there is no any information

available on performs any research related to characterization and performance of local goat to improve productivity of this goat. The socio-economic status of the farmer maintaining these goats is also an important consideration for evolving and suggesting the new technology with this view in mind the present paper focused on characterization of local goat by scientifically, which will be helpful in describing this particular local goat found in SadakArjunitahsil, (Dist. Gondia).

## MATERIALS AND METHODS

The study was carried out in Sadak Arjuni tahsil of Gondia district during the year 2017-2018. Four villages viz., Tidka, Sawangi, Bamhani and Kohlitola were randomly selected. The data regarding various characteristics and productive performance of local adult goats were collected personally by interviewing the goat owners with the help of pretested questionnaires. The list of goat rearing farmers from selected villages was prepared with the help of Gramsevak and Talathi. Total 50 goat owners were selected from each village. There by collection of data was done from total 200 goat owners of 4 villages.

The required information was gathered by personally interviewing with the goat owners. The information collected friendly and informal meeting. The data was collected by direct observation from 200 goat owners of 4 villages namely Tidka, Sawangi, Bamhani and Kohlitola in SadakArjuni Tahsil. The data was categorized in following groups according to flock size.

Sr. No.	Group according to flock size	No. of goats in flock
1	Small flock	1-15
2	Medium flock	16-30
3	Large flock	30 and above

The collected data on various variables viz., body measurement, body length, chest girth, height at wither, body weight was subjected to statistical analysis to find out mean, standard deviation, standard error and co-efficient of variation so as to estimate the central value and the extent of the variability in the data. The co-efficient of variation was estimated by adopting the standard formula reported by Panse and Sukhatme (1967).

$$\text{Co-efficient of variation} = \frac{\text{S. D.}}{\text{Mean}} \times 100$$

## RESULTS AND DISCUSSION

### Body measurement

Body growth and productive performance depend on body measurements such as body length, chest girth and height of the animals are the indicator of body growth

and production capacity of animal. The observations pertaining to these parameters presented in table 1.

### Body length

The results presented in table 1, showed that there was variation in body length of goats confined to different flock sizes. In small flock, the body length observed to be  $62.51 \pm 0.08$  cm in male and  $60.49 \pm 0.06$  cm in female goat. While in medium flock, the average body length was  $65.50 \pm 0.05$  cm in male and  $63.49 \pm 0.04$  cm in female. However,

$67.50 \pm 0.05$  cm in male and  $64.50 \pm 0.04$  cm in female goat under large flock.

The average length of body recorded in the present study is in close agreement with those reported by Acharya (1982) in Marwari goat, Osmanabadi and Chegu goat. Similar type of observation recorded by Lokhande (2005) in local goat. It was  $71.53 \pm 0.03$  cm in male and  $69.04 \pm 0.26$  cm in female goat. Lokhande (2005) reported that the mean body length in male and female  $53 \pm 0.03$  and  $69.04 \pm 0.76$ , respectively.

**Table 1. Body measurements and body weight of different flock size in local goat**

Sr. No.	Flock size	No. of animals	Sex	Body length (cm)		Average $\pm$ SE	S. D.
				Maxi	Mini		
1	Small flock	33	M	65	51	$62.51 \pm 0.08$	0.51
		67	F	62	48	$60.49 \pm 0.06$	0.54
2	Medium flock	74	M	68	53	$65.50 \pm 0.05$	0.53
		111	F	66	52	$63.49 \pm 0.04$	0.52
3	Large flock	76	M	70	54	$67.50 \pm 0.05$	0.53
		139	F	67	52	$64.50 \pm 0.04$	0.50
Sr. No.	Flock size	No. of animals	Sex	Chest girth (cm)		Average $\pm$ SE	S. D.
				Maxi	Mini		
1	Small flock	33	M	65	51	$63.54 \pm 0.20$	1.14
		67	F	62	49	$61.50 \pm 0.06$	0.54
2	Medium flock	74	M	68	55	$64.50 \pm 0.05$	0.50
		111	F	65	52	$63.50 \pm 0.04$	0.51
3	Large flock	76	M	70	56	$65.46 \pm 0.05$	0.52
		139	F	68	54	$64.50 \pm 0.04$	0.25
Sr. No.	Flock size	No. of animals	Sex	Height (cm)		Average $\pm$ SE	S. D.
				Maxi	Mini		
1	Small flock	33	M	60	45	$59.51 \pm 0.08$	2.59
		67	F	57	43	$56.50 \pm 0.06$	3.23
2	Medium flock	74	M	62	47	$60.52 \pm 0.06$	1.80
		111	F	62	46	$61.50 \pm 0.04$	1.81
3	Large flock	76	M	65	50	$64.50 \pm 0.05$	2.17
		139	F	64	49	$63.51 \pm 0.04$	2.01
Sr. No.	Flock size	No. of animals	Sex	Weight (kg)		Average $\pm$ SE	S. D.
				Maxi	Mini		
1	Small flock	33	M	23	15	$21.88 \pm 0.17$	1.08
		67	F	21	12	$20.07 \pm 0.09$	0.80
2	Medium flock	74	M	24	14	$23.04 \pm 0.09$	0.81
		111	F	22	14	$21.06 \pm 0.07$	0.78
3	Large flock	76	M	28	18	$26.21 \pm 0.15$	1.31
		139	F	24	14	$23.01 \pm 0.06$	0.81

### Chest girth

It is revealed from table 1 that the average chest girth in small flock was found to be  $63.54 \pm 0.20$  cm in male and  $61.50 \pm 0.06$  cm in female. While in medium flock, it was  $64.50 \pm 0.05$  cm in male and  $63.50 \pm 0.04$  cm in female. In large flock the average chest girth was  $65.46 \pm 0.05$  cm in male and  $64.50 \pm 0.04$  cm in female goat.

More or less similar observation recorded by Katekhaye (2011) in Berari goat. It was found to be  $63.33 \pm 1.264$  cm in male and  $62.00 \pm 5.838$  cm in female goats. Likewise, Asekar (2015) also observed the more or less similar trends with respect to chest girth in local goats. It was found to be  $64.81 \pm 0.45$  cm in male and  $63.41 \pm 0.48$  cm in female goats. Bhoite (1994) observed comparatively more chest girth in

Sangamneri goat that is 80.20 cm in male and 74.12 cm in female. Varade and Ali (1997) reported that 12 month age group chest girth was 68.69 cm in male and 66.82 cm in female.

#### Height at wither

The flock wise mean height at wither along with SE presented in table 1.

In small flock, the average height of male goat was 59.51±0.08 cm and 56.50±0.06 cm in female goat. The average height in medium flock was found to be 60.52±0.06 cm in male and 61.50±0.04 cm in female. However, in large flock the height of male goat was 64.50±0.05 cm and in female goat it was 63.51±0.04 cm.

The present trends on height at wither are more or less similar with the results of Katekhaye (2011), she reported height at wither 64.00±0.734 cm in male and 65.00±6.027 cm in female adult goat.

#### Body weight

The data recorded on body weight of local goats are presented in table 1. It is essential to get acquainted with the body weight of animals to decide its heaviness or lightness.

In small flock, the average body weight of animals was found to be 21.88±0.17 kg in male and 20.07±0.09 kg in female. In medium flock, it was 23.04±0.09 kg in male and 21.06±0.07 kg in female goat. It was increased up to 26.21±0.15 kg in male and 23.01±0.06 kg in female in large size flock.

The average body weight found in the present study is comparable with those reported by Lokhande (2005) and Katekhaye (2011) in local goat (54.92±0.36 kg in male and 35.13±0.29 kg in female goat) and Berari goat (24.14±0.751 kg in male and 19.01±0.641 kg in female goat.), respectively.

However, Mukherjee (1980) observed comparatively less body weight in Grey Bengal goat while, Mishra and Koratkar (1994) observed comparatively more body weight in Sangamneri goat.

#### Production trait

Lactation record pertaining to day<sup>-1</sup> milk yield and lactation period was collected from goat keeper and by direct observation. The data of 500 goats were analyzed and mean value along with standard error and S. D. are presented in table 2.

#### Milk yield day<sup>-1</sup>

The data presented in table 2, indicates that average daily milk yield was observed to be 469±0.05 g.

Similar observations were recorded by Katekhaye (2011) in Berari goat, who noticed 500±32.27 g. average daily milk yield. Similarly, Lokhande (2005) reported that local goat yielded the average daily milk in the range of 0.229 to 1.200 kg animal<sup>-1</sup>.

In local goat the average daily milk yield ranging from 474±0.89 g as reported by Asekar (2015).

**Table 2. Mean standard error values and coefficient of variation of production traits of goats**

Sr. No.	Prouction traits	Units	Mean	SD	SE	C.V.%
1	Lactation yield	g day <sup>-1</sup>	469	1.14	0.05	0.24
2	Lactation period	Days	132	0.50	0.02	0.38

#### Lactation period

As per the information obtained from goat keepers through personal interaction during the survey, local goat is not a very good milch animal but yields 0.5 to 1.0 liter milk day<sup>-1</sup>. The farm records revealed the average lactation yield to be 469 g day<sup>-1</sup> and an average lactation period 132±0.02 days.

From table 2 it is indicated that the average lactation period of Berari goat was found to be 132 ±0.02 days.

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