

Study of Growth Rate of Black Bengal Goat (*Capra hircus*) In Different Diet and Rearing Conditions

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Abstract

30 Black Bengal goats (3 ± 0.10 months of age and 3± 1 kg body weight) were taken for study, 15 from four farming families of Bishnupur sub division and another 15 from kotulpur goat farm, Bishnupur. The farmers reared goats by extensive system and in farm they were reared under intensive system. The first group of goats collects their feeding by grazing and foraging on natural vegetation in pasture land. In intensive farming system goats were given with the supplementation of concentrate mixture with *ad libitum* green grasses and some tree leaves under stall-feed condition. After 214 days the average daily weight gain for extensive and intensive system was 31.49±0.20 and 34.29±0.21 grams/day respectively. After data analysis the study found no significant difference ($p>0.05$) between the growth rates of the two different groups.

Keywords: Black Bengal Goat, Growth Rate, Different Diet, Extensive Condition, Intensive Condition.

Introduction

The flexible feeding habits of goats and their ability to adapt to a wide variety of environment reflects that they can be managed under all types of animal husbandry from the intensive to the most extensive forms of nomadic grazing (Acharya, 1992). Goats can efficiently survive on available shrubs and trees in harsh environments and on low-fertility lands where no crop can be grown. They are cheap to procure and easy to rear so they are called the "poor man's cow". Especially women and children from marginal land less farmer families rear the goats during their leisure time to support the family economically. Goat rearing is an age long practice for a large segment of the poor population in rural India.

The Black Bengal goat (*Capra hircus*), a typical dwarf variety has a great contribution on quality meat, quality skin as well as an average quantity of milk production. They also have a very good reproduction rate. With the potential to provide high-quality meat and milk, the Black Bengal goat is considered as an important source of nutrients as well as an important part of economy for people in most rural families. Goats are also used in ceremonial feasts and for the payment of social dues. Keeping in view of its importance for socio-economic development of poor people, this study was designed to find the effects of different feeding habits and diet on growth Performance of Black Bengal Goats reared under extensive grazing system and in intensive system. The growth rate that is change in body weight is directly associated with the marketing value and economic returns.

Objective of The Study

The rural families of Bishnupur sub division, West Bengal, reared the Black Bengal goats mainly for economic returns. Market value of the goats is directly proportional with the body weight. The body weight gain on the other hand is intensely dependent on diet. In extensive grazing system the goats collect their food mainly from the pasture lands with poor natural vegetation. On contrary in the intensive system they were feed by concentrate supplements with green grass and tree leaves. The main objective of the study is to monitor and record the growth rate of goats with two different types of diets and rearing conditions. The goat farm and rural families are the two main source of goat meat supply to market. So the study selects goats from these two sources.



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Review of Literature

Black Bengal goat is well documented as a household source of economy for rural farmers. Previous works show that they have a high adaptability, reproduction rate, fecundity. A study from Bangladesh shows that the growth rate in terms of body weight gain varies among sex, parity, litter size, birth weight of kids, seasons, regions (Husain et al. 1996). Under stall-feed condition variation in tree leaves as feed make a significant difference in body weight gain of goats (Kibrai et al 1994). Their reproductive performance also varies according to their rearing condition and diet (Hassan et al). In intensive condition the total dry matter intake varies significantly according to concentrate supplementation but weight gain difference is not significant (Sultana et al 2012). Kabir *et al.* (2002) found that the growth rate of Black Bengal goats ranged from 37.5 to 40.3g/day and mentioned that high level of protein in the diet significantly influenced the live weight gain. In rural West Bengal small marginal farmers mainly rear the goats in extensive system without any supplementation of diet (Debraj Nandi et al 2011). Based on these findings and observations the present study was designed to find any significant difference at body weight gain between the goats reared in extensive and intensive condition and different diet. Bishnupur sub division of Bankura district of West Bengal has a great reserve of Black Bengal goat so the present study findings can contribute a lot to existing documents.

Concepts and Hypothesis

Goats are reared in extensive grazing system mainly by the marginal rural people of low socio economic condition of west Bengal. Almost 90% goats of slaughter house come from these families. As these farmers cannot provide any supplementation of food the goats totally depend on the poor natural vegetation and grasses available in the pasture lands for diet. On the other hand in intensive system the goats reared in the goat farm have a concentrated supplement with *ad libitum* green grass and tree leaves. So the main concept of the study is to compare the growth rate of the two groups of goats and identify if there is any significance difference in growth rate between the above mentioned groups.

Methodology**Selection of Study Area**

The study was conducted at Bishnupur sub division of Bankura district, West Bengal and at the goat farm of Kotulpur, Bankura.

Selection of Goats

2 groups of goats were selected from two different places for the study. First group of goats (n=15) from four rural farmer families of a village of Bishnupur, reared under extensive condition. Second group of goats (n=15) were selected from Kotulpur goat farm, reared under intensive condition. The goats were selected based on their age, sex and litter size.

Rearing System

The first group of goats was reared by the farmers by extensive grazing system. They were generally taken out for grazing during day light, from 8

a.m. to 5 p.m. On contrary in intensive system the goats were handled by the workers of the farm and they were feed by supplementation of concentrate mixture with *ad libitum* green grasses and tree leaves in stall-feed condition.

Study Period

The study was conducted for a period of 7 months, starting from March 2017 to September 2017.

Food and Feeding

For extensive system goats collect their food by grazing on pasture land and natural vegetation. They prefer Durva grass (*Cynodon dactylon*), Motha grass (*Cyperus rotundus*), leaves of Aswattha (*Ficus religiosa*), Jackfruit (*Artocarpus heterophyllus*), Tamarind (*Tamarindus indica*) etc.

For intensive system goats were feed with concentrate supplements at a daily rate of 100 to 250 grams depending on their age with *ad libitum* Motha grass, Stylo grass (*Stylosanthes guianensis*), leaves of jackfruit trees at stall-feed condition.

Components of Concentrate Supplement

Name	Amount (in %)
Crushed maize	30
Wheat bran	50
Mustard oil cake	9
Vitamin mineral premix	0.1
Salt	0.9

Data Collection

A door to door survey was carried out at the first time for extensive system to kid selection and data collection. The subsequent data were collected by visiting the farmer families every 15 days. Data for intensive system were collected by visiting the goat farm at the same interval. The body weight (kg) of kids was taken by digital weighing balance in every 15 days. The daily average weight gain of kids was calculated on the basis of these data.

Data Analysis

LSM (least square mean), SE (Standard Error), Chi-square test was performed by MS Word and MS Excel.

Results and Discussion

Table 1: Monthly and Daily Average Weight Gain Of Goats.

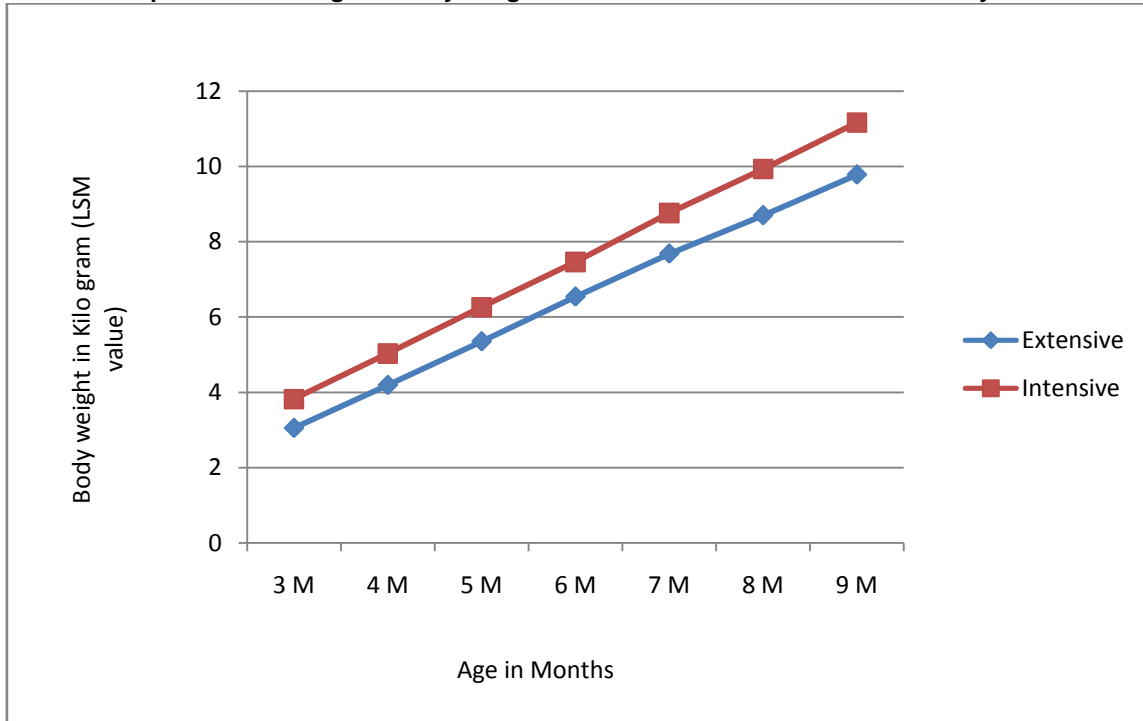
Months	Extensive (n=15, M=7, F=8)	Intensive (n=15, M=8, F=7)
	*LSM \pm **SE	LSM \pm SE
3	3.05 \pm 0.01	3.82 \pm 0.06
4	4.19 \pm 0.01	5.03 \pm 0.08
5	5.35 \pm 0.01	6.26 \pm 0.09
6	6.54 \pm 0.01	7.46 \pm 0.09
7	7.68 \pm 0.02	8.76 \pm 0.10
8	8.70 \pm 0.02	9.93 \pm 0.11
9	9.78 \pm 0.01	11.16 \pm 0.10
Daily average weight gain (grams/day)	31.49 \pm 0.20	34.29 \pm 0.21

*LSM= Least Square Mean, ** SE= Standard Error, n= Total number of individual, M=male, F=Female

Table 1 shows the month wise weight gain (LSM value) of goats and the daily average weight gain under extensive and intensive system respectively. For extensive system the average weight

gain is 31.49 ± 0.20 grams/day and for intensive system the value is 34.29 ± 0.21 grams/day.

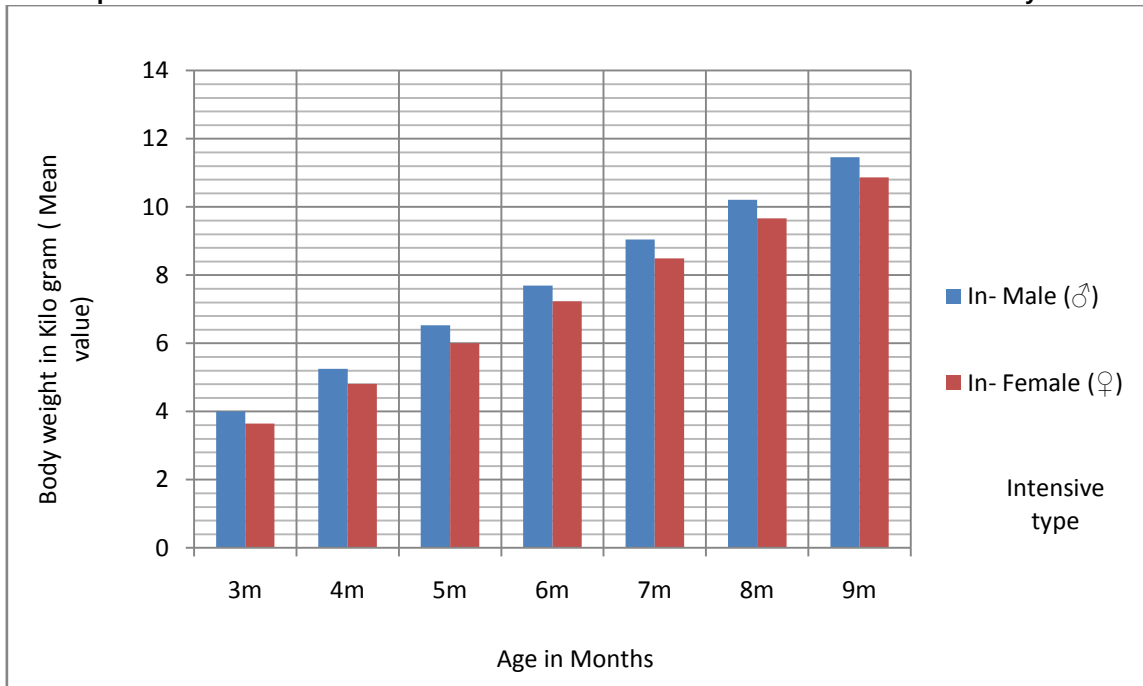
Graph 1: The Average Monthly Weight of Goats of Extensive and Intensive System

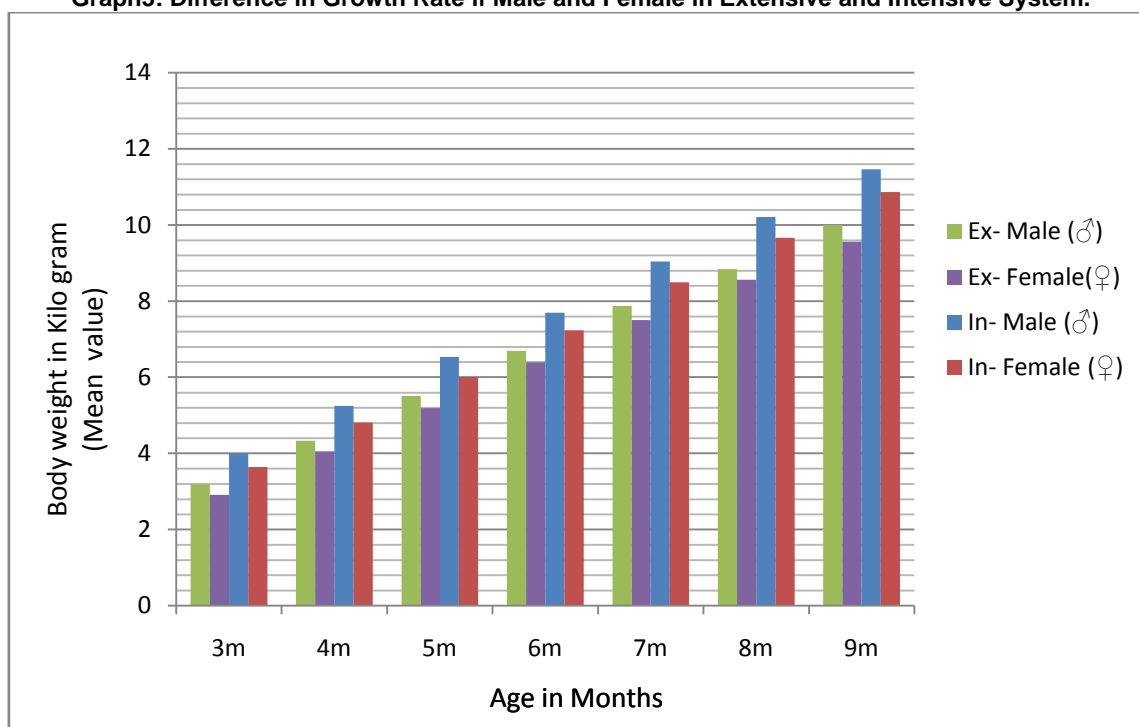


Graph 1 shows a comparative presentation of growth rate of extensive and intensive system. The result shows that in intensive system goats has a

higher growth rate than goats from extensive system of same age. The concentrate supplementation has a positive effect on growth performance.

Graph 2: The Difference In Growth Rate Of Male And Female Goats Under Intensive System.



Graph3: Difference in Growth Rate if Male and Female in Extensive and Intensive System.

Both graph 2 and graph 3 shows that, in both extensive and intensive system male goats have a higher growth rate than female.

Conclusion

The average weight gain of Black Bengal goats reared under extensive condition is 31.49 ± 0.20 grams/day. Goats reared under intensive system gain 34.29 ± 0.21 grams/day. The higher growth rate of intensive system indicates that concentrate supplementation has a positive effect on growth of kids but the difference of daily average growth rate between the two groups is not significant ($p > 0.05$). The captive rearing condition has no negative effect on growth rate, as the study shown. So, it can be concluded that a natural grazing system with a healthy farming condition can yield a satisfactory amount of meat from black Bengal goat.

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