
ORIGINAL ARTICLE

Study on Managemental Practices of Black Bengal Goats in Two Agro-Climatic Sub-Regions of West Bengal.

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ABSTRACT

The study was carried on three hundred seventy six Black Bengal goats in two sub regions of West Bengal. The information pertaining to the present study was collected from two hundred ninety three goat farmers by participatory and rapid rural appraisal techniques in repeated interactions. Majority of the farmers 76.43% in GFP (Gangetic Food Plane) and 80.88% in CFP (Coastal Food Plane) kept their goats in a part of their own residence. The floor upon which goats were housed found to be mostly Katcha with 87.26 and 95.59 percent katcha floor in GFP and CFP respectively. The drainage system in the animal house was found to be poor in majority of the cases and only 35.03 and 29.41 percent houses had good drainage system. 94.9 percent and 97.05 percent of the farmers under study area in GFP and CFP consulted a veterinary doctor in case of sick animals. The farmers reported that castrated animals fetched better price and showed better growth in respect to non castrated one. Only 15.92% and 16.17% of farmers' supplemented compound concentrate to their goats in GFP and CFP. Cereal byproducts are readily available and provided by majority of farmers. Majority of the farmers 97.45% (GFP) and all farmers in CFP reported goat farming profitable. All the farmers reported that they were provided buck free of service under AICRP-G. In GFP, pre weaning kid mortality was highest due to Pneumonia (17.42%), followed by coccidiosis (15.33%), warm load (15.15%), non specific diarrhoea (13.64%), general weakness (9.85%), cold shock (8.33%), toxemia (6.82%) and septicemia (1.15%). In both the same regions the trend of pre weaning kid mortality was more or less same. From the study, it was concluded that the production traits of goats in two sub regions were not differing significantly due to more or less similar practices in terms of housing, feeding, grazing etc. Pre-weaning kid mortality is more in CFP than GFP sub-regions and causes behind the kid mortality were more or less similar.

Key words: Black Bengal goat, GFP, CFP, Katcha floor, AICRP-G, Coccidiosis

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INTRODUCTION

Goat often regarded as 'poor man's cow' was the first domesticated ruminant. Devendra [4] reported that people with limited resources get benefit by rearing goats or other small ruminants. In India, incomes from livestock farming account for 15–40% of total farm household earnings [11]. According to the latest Economic Survey, livestock accounts for nearly 5% of the country's gross domestic product.

Sale of goats and goat products (meat, skin and milk) by farmers is the major source of cash for purchase of clothes, grains and other essential household commodities. Goats represent a more liquid form of capital than cattle and are readily tradable [9].

Despite high goat population in India, the productivity per unit of animal and share of this sector to the national economy is relatively low. Poor grazing and low quality feeds especially in terms of energy or protein leads to undernourishment and low productivity. Under such circumstances, the concept of

utilizing locally available agro-industrial by-products as a supplementary feed may be a feasible feeding system for farmers. Goat rearing is one of the important agricultural enterprises particularly in rural parts of this country and has proved very useful to man throughout the ages, largely because of their adaptability to varying environmental conditions under which the breeds and strain types have evolved and in which they are maintained.

Scarcity of income has often lead to outmigration of men from rural areas which has lead to greater involvement of women in rearing domestic animals and birds and in particular goats. Goats can be handled and cared by almost all family members.

West Bengal possesses a valuable genetic resource of dwarf goat called Black Bengal Goat (Synonym Bengal Goat). Black Bengal goats possess the unique characteristics of high prolificacy (avg. 2.8 kidding rate), short kidding interval, early slaughter weight, delicious lean meat and super fine skin quality.

In animal husbandry sector, goat is one of the most profitable one, yet there are some constrains of goatery farming development on scientific basis for better production due to:

- Inadequate supply of quality green fodder as well as concentrate.
- High kid mortality (approx 60% in farm condition) due to error managemental practices and lack of nutrients (optimum milk cannot obtained from under fed does)
- Lack of proper breeding management (inbreeding depression mostly observed in field condition).

Black Bengal goat is mainly a meat type breed and famous for meat, skin quality and high prolificacy. The most predominant colour is black, other two varieties were found viz. white and brown but percentages of such varieties were very less.

The present study has been undertaken in field condition to study the managemental practices of goats in two agro-climatic sub-regions of West Bengal.

MATERIALS AND METHODS

The data pertaining to the managemental practices of goat production at village level were carried out in two agro-climatic sub-regions viz. Gangetic Flood Plain (GFP) that includes Ayeshpur-Panchpota and Ganguria villages of Nadia district and Coastal Flood Plain (CFP) that includes Jatirampur village of Gosaba in the South-24-Parganas under Agro-climatic regions of Lower Gangetic Plain Region, Zone-II of West Bengal.

Management practices of goats:

Housing:

There are different types of housing system of goats observed in village condition as mentioned hereunder. Floor space, height of houses, cleanliness and drainage system are recorded by a thorough questionnaire to the goat owners. There are several types of housing system observed which are mentioned as follows.

- Kutch* separate house for goat.
- Kutch* house with separate pens for different livestock.
- Pucca* separate house for goat.
- Kutch* house for different livestock
- Keeping the goats along with human being as a part of residence (few instances where there is little scope for keeping the goat in separate place).

Breeding Practices:

- Recognition of oestrus or heat in goats
- Source of Buck (hired, own or AICRP-G)
- Is the buck changed on successive mating? (Yes/no)
- Do farmers take extra care of buck during pregnancy? (Yes/no)

Feeding Practices:

Feeding practices in the village level in the two sub-regions in two ways, viz. grazing and supplement of little homemade concentrate. Generally grazing is allowed from 9.00 A.M to 3.00P.M (6 hours) on continuous basis during winter season and from 7.00 A.M to 12.00 noon & from 3.00 P.M to 6.00 P.M (8 hours) on intermittent basis during summer. During rainy season only few hours of grazing allowed if the weather is favourable and supply of some tree leaves. Farmers often practice tethering in place of free grazing. Certain percentages of goat owners allow both grazing and tethering (grazing in the morning & tethering in the afternoon). Supplementation of concentrate to goats as practiced by farmers is very less. Few number of goat owners can supply balanced concentrate mixture, very less percentage of farmers provide single concentrate (e.g. broken wheat) or combination of two or three (e.g. mixture of broken wheat, broken rice & oil cakes). Few farmers are practiced in feeding of mineral mixture through rice gruel.

Health Monitoring

Most of the goat owners under the study area are practiced vaccinations, deworming and other managerial practices to prevent against contagious & infectious diseases that includes cleaning, disinfection and sanitary measures. The information regarding the advice taken during the illness of animals, vaccination, treatment of ectoparasites, deworming schedule, colostrum feeding, castration practice etc. were recorded from the farmers through the questionnaire method.

Pre-weaning kid mortality: Information regarding the mortality up to weaning was collected in the following matters percentage wise.

Location wise mortality: From the field units' information collected in the basis of number of kids born and number of death for analyzing location wise effect on mortality.

Casual disease for mortality: Common diseases for mortality in the study area were pneumonia, enteritis, and coccidiosis. Other diseases/disorders include anorexia, internal parasitic load, malnutrition, cold shock, toxemia, septicaemia and other causes like snake bite, dog bite, predators etc. Numbers of deaths in different diseases were collected during the study period up to pre-weaning age from the study area.

Statistical analysis

All the data were analyzed multivariate, univariate analysis of variance technique in the generalized linear model (GLM) and also by comparative means of SPSS (Version 21.0). A probability value of $P < 0.05$ was described as statistically significant and that $P < 0.1$ was described as a trend.

RESULTS AND DISCUSSION

The present study was carried in two agro-climatic sub-regions viz. Gangetic Flood Plain (GFP) & Coastal Flood Plain (CFP) under agro-climatic regions of Lower Gangetic Plain Region, CFP of West Bengal with comparison to managerial practices of goats.

From the table 1 it has been observed that majority of the farmers, 76.43% in GFP and 80.88% in CFP sub-regions kept their goats in a part of their own residence. The findings are in agreement with Singh *et al.* [10] and partial agreement with the study of Nandi *et al.* [8] where they showed 32.9% farmers kept their goat in separate house

Farmers generally kept their goats in a part of their own residence may be due to the fact that it did not demanded separate arrangement and extra cost involvement for preparing a separate housing structure. Further it was also found that they felt more comfortable and secured in avoiding predators and theft especially during the night, as goat being a small ruminant is prone to this kind of menace. Majority of the respondents in GFP and CFP sub-regions did not provided with optimum floor space for goats. As most of them maintained their animals in a part of their residence, the farmers often compromised with the floor space requirement. Further the farmers under this study seemed to have no idea regarding the standard floor space requirement.

The height of house in majority of cases was found to be optimum may be due to the fact that mostly the animals were maintained in a part of their own residence. In CFP the height required at the eaves was lower compared to that of other sub-region as this area is prone to more rain fall.

The overall housing in two sub-regions did not differed much as mostly goats are reared with least or zero investment in housing. The height at eaves was lower in CFP in comparison to GFP and the reason behind that is mainly due to higher rainfall. In CFP use of mosquito net in the animal house was found to be common as prevalence of flies and mosquitoes in this area is high.

The figure in table 2 indicates that majority of the farmers in GFP and CFP consulted a Veterinary doctor in case of sick animals. The present study comprises of the animals and farmers under AICRP on Black Bengal goat and the consciousness of farmers to consult a Veterinary doctor may be due to that fact. A small section (4.1% in total) of the farmers also availed the service of some trained persons in case of unavailability of veterinary doctor. Vaccination of the goats is of outmost importance to prevent deadly diseases goats. Majority of the farmers in GFP and CFP vaccinated their animals against Peste-Des-Petites Ruminants (PPR) and Goat Pox. Regular awareness programme and free vaccination has probably led to acceptability and practice of vaccination in these rural areas. The findings are in agreement with Deshpande *et al.* [3] who also reported vaccination to be followed by majority of the goat keepers in south Gujarat region.

In both the sub-regions farmers were found to be aware of importance of deworming and regularly dewormed their goats. The awareness and practice of deworming in majority of the households may be attributed to awareness programmes and free distribution of anthelmintics by AICRP on Black Bengal goat and Animal Resource Development (ARD) department government of West Bengal. Respondents also revealed that they were aware of the importance of deworming and if needed also bought

anthelmintics when required from local pharmacy. The findings here doesn't agree with the findings of Deshpande *et al.* [3] who found only 22.04% of the farmers to deworming their goats further he also did not specified if they followed proper deworming schedule.

Very few farmers resorted to the scientific management of naval cord in the new born kids. This may be due to the fact that the farmers were not much aware of the scientific management and unavailability of proper disinfectants readily.

Colostrum was feed to cent percent kids within two hours of birth in both the sub-regions which is recommended as scientific management of kids. The farmers were aware of the importance of feeding colostrum to kids and ensured suckling of the same at the earliest. Deshpande *et al.* [2] also reported similar findings in south Gujarat region where 73.21% owners castrated their male kids. Both open and close method of castration were followed and goat rearers preferred trained persons working under the AICRP project on Black Bengal goat or local veterinary hospitals to perform the necessary operation. The convenience of service of castration at door step by this persons is always preferred than taking the animals to nearby veterinary hospital.

Table 1 Distribution of farmers rearing Black Bengal goat according to housing management practiced in two agro-climatic sub-regions of W.B.

Particulars of housing	GFP (n=157)	CFP (n=136)	Total (n=293)
Type of house i) Part of residence ii) Separate	120 (76.43) 37 (23.57)	110 (80.88) 26 (19.12)	230 (78.49) 63 (21.51)
Floor space of covered area Optimum Not optimum	45 (28.67) 112 (71.33)	28 (20.59) 108 (79.41)	73 (20.91) 220 (75.09)
Height of house Optimum Not optimum	90 (57.32) 67 (42.68)	80 (58.82) 56 (41.18)	170 (58.02) 123 (41.98)
Ventilation of house Good Poor	96 (61.14) 61 (38.86)	87 (63.97) 49 (36.03)	183 (62.46) 110 (37.54)
Cleanliness of house Dirty Clean	37 (23.57) 120 (76.43)	43 (31.62) 93 (68.38)	80 (27.30) 213 (72.7)
Type of floor Kutchha Pucca	137 (87.26) 20 (12.74)	130 (95.59) 6 (4.41)	267 (91.13) 26 (8.87)
Drainage Good Poor	55 (35.03) 102 (64.97)	40 (29.41) 96 (70.59)	95 (32.42) 198 (67.58)

Values in parenthesis are in percentage

From the table 3, it has been evident that goats in these areas are reared with minimum investment and supplementation of compound concentrate was not practiced by majority of the farmers. Only a few farmers 15.28% (GFP) and 15.44% (CFP) supplemented mineral mixture regularly to goats. The farmers were aware about the importance of mineral mixture feeding but the practice involves buying of the supplement which acts as a deterrent.

Drinking water is one of the most important factors directly related to animal health and clean drinking water is one of the prerequisite for proper management. CFP has severe clean drinking water scarcity being in the coastal belt and often invaded by floods the availability of clean drinking water is scarce.

The table 4 indicates that meager 2.55% farmers considered goat farming to be unprofitable in GFP and on enquiry sited that they lost their stock due to disease and menace of predator in the recent times. None of the farmers kept record of their input or output. They reported that they had no idea about the cost involved in rearing and the profit gained out of sale of their animals or products. But most of them believed that goat keeping was profitable.

Table 2 Distribution of farmers rearing Black Bengal goat according to health care practices followed in two agro-climatic sub-regions of W.B.

Attributes	GFP (n=157)	CFP (n=136)	Total (n=293)
Advice taken regarding sick animal			
i) Veterinary doctor	149 (94.90)	132 (97.05)	281 (95.90)
ii) Quack	0	0	0
iii) Others	8 (5.10)	4 (2.95)	12 (4.10)
Any vaccination done			
i) Yes	151 (96.17)	131 (96.32)	282 (96.24)
ii) No	6 (3.83)	5 (3.68)	11 (3.76)
Treatment of ectoparasite			
i) Yes	120 (76.43)	110 (80.88)	230 (78.50)
ii) No	37 (23.57)	26 (19.12)	63 (21.50)
Proper deworming schedule followed			
i) Yes	150 (95.54)	131 (96.32)	281 (95.91)
ii) No	7 (4.46)	5 (3.68)	12 (4.09)
Cutting naval cord of Kids scientifically			
i) Yes	56 (35.67)	32 (23.53)	88 (30.03)
ii) No	101 (64.33)	104 (76.47)	205 (69.97)
Feeding colostrum to kids			
i) Just after birth	130 (82.80)	120 (88.24)	250 (85.32)
ii) Within 2 hours	27 (17.20)	16 (11.76)	43 (14.68)
iii) After 2 hours	0	0	0
Castration practiced			
i) Yes	149 (94.90)	132 (97.06)	281 (95.90)
ii) No	8 (5.10)	4 (2.94)	12 (4.10)
Castration done with the help of			
i) Trained person	150 (95.54)	120 (88.24)	270 (91.89)
ii) Quack	0	0	0
iii) Local Vet. Hospital	7 (4.45)	16 (11.76)	23 (8.11)
iv) Others	0	0	0

Values in parenthesis are in percentage

Table 3 Distribution of farmers rearing Black Bengal goat according to feeding practices followed in two agro-climatic sub-regions of W.B.

Attributes	GFP (n=157)	CFP (n=136)	Total (n=293)
Supplement compound concentrate	25 (15.92)	22 (16.17)	47 (16.04)
Supplement mineral mixture	24 (15.28)	21 (15.44)	45 (15.35)
Cereal by-product	102 (64.96)	112 (82.35)	148 (73.04)
Feed kitchen waste	157 (100)	136 (100)	293 (100)
Drinking water			
Well	6 (3.82)	0	6 (2.04)
Pond	0	104 (76.47)	104 (35.49)
Tube well/supply water	151 (96.18)	32 (23.52)	183 (62.46)

Values in parenthesis are in percentage

Marketing goat is not a problem as there is huge demand in the market. Black Bengal goat meat and skin is in high demand and fetch high price in the market. The findings are in disagreement with Ekambram *et al.* [6] who reported that 42% Mahabubnagar goat farmers found difficulty in selling their animals. One of the major reasons for acceptance of goat rearing is ready availability of market and goat is often sold in case of financial emergency or financial stress in the family. Hundred percent of the farmers in both the sub-regions reported that they sold their animals in case of financial emergency like sudden need of cash in case of medical emergency etc. Goat being a small ruminant and in high market demand can easily be sold and acts as living bank.

Table 4 Distribution of farmers rearing Black Bengal goat according to economics in two agro-climatic sub-regions

Attributes	GFP (n=157)	CFP (n=136)	Total (n=293)
Is goat farming Profitable?			
Yes	153(97.45)	136 (100)	293 (98.63)
No	4 (2.55)	0(0)	0(1.37)
Record keeping of input/output			
Yes	0	0	0
No	157(100)	136(100)	293(100)
Availability of market for goat			
Through middleman	124(78.98)	120(88.23)	244(83.27)
Directly to market	33(21.02)	16(11.77)	49(16.72)
Stress/ emergency sale of goats			
Yes	157	136	293
No	0	0	0
Sale of kids			
Yes	36(22.93)	23(16.91)	59(20.14)
No	121(77.07)	113(83.09)	234(79.86)
Sale targeted during festival season			
Yes	139(88.54)	125(91.91)	264(90.10)
No	18(11.46)	11(8.08)	29(9.90)

Values in parenthesis are in percentage

Table 5 Distribution of farmers rearing Black Bengal goat according to Breeding Management practices followed in two agro-climatic sub-regions

Attributes	GFP (n=157)	CFP (n=136)	Total (n=293)
Recognition of oestrus in goats			
Yes	157(100)	136(100)	293(100)
No	0	0	0
Buck Source			
Own	0	0	0
Hired	0	0	0
AICRP-G	157(100)	136(100)	293(100)
Is the buck changed on successive mating?			
Yes	157(100)	136(100)	293(100)
No	0	0	0
Extra care during Pregnancy			
Yes	148(94.26)	128(94.11)	276(94.19)
No	9(5.74)	8(5.89)	17(5.81)

Values in parenthesis are in percentage

Table 6 Pre-Weaning kid mortality pattern of Black Bengal goat in two agro-climatic sub-regions

Attributes	GFP Mortality (%)	CPF Mortality (%)	Total Mortality (%)
Pneumonia	17.42	18.00	17.73
Coccidiosis	15.15	15.33	15.25
Worm load	15.15	14.00	14.54
Non-specific diarrhoea	13.64	17.33	15.60
General weakness	9.85	11.33	10.64
Cold shock	8.33	6.00	7.09
Toxaemia	6.82	3.33	4.96
Septicaemia	1.51	2.67	2.13
Other (like snake bite, dog bite, predator)	12.12	12.00	12.05

The table 5 depicted the various breeding practices followed by the farmers in the two studied areas under two agro-climatic sub-regions of West Bengal.

Pre-Weaning kid mortality (0-3 months) was studied in both the sub-regions during the study period (Table 6). Lodh *et al.* [7] reported 49.28% death of Black Bengal kids. Chowdhury *et al* [2] reported the kids (0-3 months) mortality mainly due to pneumonia (42.39%) followed by diarrhoea (32.61%). Donkin and Boyazoglu [5] observed that maximum kid mortality due to pneumonia (54%) followed by coccidiosis (53%), cachexia (15%), puerperal infections (15%) & enteritis (9%). Bera *et al* [1] reported that the causes of kid mortality were due to enteritis (36.62%), PPR (26.72%), pneumonia (9.86%), HS (12.68%) and others (14.08%)

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