



A REPORT ON CASE STUDY OF A GAYAL FARM LOCATED AT PADUA, SUKHBILASH RANGUNIA, CHATTOGRAM.

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List of Abbreviations

Abbreviation and Symbol	Elaboration
CVASU	Chattogram Veterinary and Animal Sciences University
FMD	Food and mouth disease
HS	Hemorrhagic septicemia
BLRI	Bangladesh Livestock Research Institute
LRI	Livestock research institute
UVH	Upazilla veterinary hospital
MI/Day	Milliliter per day

Abstract

This study is about gayal (*Bos frontalis*) a semi domesticated and endangered bovine species in Bangladesh. It was conducted to know the performances, utilities and prospects of gayal Farming. Gayals are reared under extensive management system in the forest of Bandarban Hill district. They browse forest herbs and grass freely in the forest and come to human dwelling for salt licking. In 2007, Ershad started his gayal farm with 40 Gayals. Before that he collected three Gayals from an indigenous family of Rangamati. It was just a hobby back then and now he understands the rising demand of it. There are some indigenous people who are also rearing it in the hill forests but they do it in their own way. Reproductive efficiency is high and calving interval is around 400 days. Gayal is used only as meat animal. The growth rate and reproductive efficiency of gayal indicates that this species can be conserved and used economically in Bangladesh if a well-planned breeding program combined with sound extension service can be made and executed.

Key words: Rising demand, indigenous people, Reproductive efficiency, Breeding program.

Chapter: 1

Introduction

Cattle farmers of Chattogram, Rangamati and Bandarban have achieved remarkable success in breeding Gayal, which is an endangered feral animal species of Bangladesh. Its scientific name is *Bos frontalis* and is also known as 'mythun' or 'mithan' to the inhabitants of the forests along the hill in India. Since it's mostly seen in the Chattogram's hilly forest areas, it's also being called Chattogram Bison. It is more profitable than farming cattle. This will not only save the endangered animal; livestock farmers can make more profits from it compared to cattle farming. Back in 2007, Gayal came out of forests and people embraced the animal. It was earlier prohibited to farm but there is no restriction now. However, many farmers back then didn't understand the real prospect of the animal. But, Ershad Mahmud, a successful gayal farmer did understand its importance and started farming it with a high commercial hope. Originated in the country's hill forests, especially the hill districts, Gayal is a graminivorous animal. Ershad didn't restrict the Gayals in his farm. They roam around the hills freely and come back to his farm. He wants to see that Gayals can eat and recover from their diseases from the nature. However, the ones that only roam around in the forest can't become as big as Ershad has in his farms. "They need extra care," says Ershad. They may weigh up to 400 to 800 kilograms. He sold Gayal during the Eid-ul-Azha, each one varying from Tk 2 lakh (2372 USD) to Tk 3.5 lakh (4152 USD). Seeing Ershad's success, some other farmers have started breeding and farming Gayals in Bandarban, Rangamati and Chattogram. Its meat is more popular in Chattogram region as it is tastier than cattle meat and has less fat. Across the country the government is working a lot to meet the demand of animal protein. American Brahman breeding has started extensively. As the illegal import has stopped, many farmers have joined in cattle farming to give boost to the livestock market. People like Ershad has been rearing it for 12 years now and show us hope by gaining great commercial success. He firmly believes Gayal would contribute immensely in animal protein. In this regard, the government has to encourage Gayal farming and provide financial support to such farmers so that it becomes an emerging sector to meet the demand for meat in the country.

Objectives of the study:

The overall objective of this case study was to investigate various aspects of Gayal and Gayal farming in selected areas. The following are the specific objectives of the study:

- To evaluate the prospects of gayal farming in Bangladesh.
- To recommend farmers about the rearing and management practice to be applied at gayal farm.
- To identify the marketing channel of gayal.
- To identify the problem of gayal farming and suggested measures for improvement of market.

Chapter: 2

Review of literature

Classification of gayal:

KINGDOM: Animalia

PHYLUM: Chordata

SUBPHYLUM: Vertebrata

CLASS: Mammalia

ORDER: Artiodactyla

FAMILY: Bovidae

SUBFAMILY: Bovinae

GENUS: Bos

SPECIES: *Bos frontalis*

Domestication

Gayals have originated more than 8000 years ago and are thought to be descendent from wild gaur. These animals play an important role in the social, cultural and economic life of local people. To own a gayal is considered to be the sign of prosperity and wealth of the family. Farmers mainly rear these animals for meat. Besides this gayals are also used as a marriage gift and sacrificial animal for different social and cultural ceremonies.

Morphology of Gayal

Gayal has typical appearance. The head, at the upper part, is very broad and flat, and is contracted suddenly towards the nose, which is naked, like that of the common cow. From the upper angle of the forehead proceeded two thick, short, horizontal horns, which are smooth and lied nearly in the plane of the forehead. They are diverged outward, and turned upward with a gentle curve. At the bases, they're very thick, and are slightly compressed. The neck is very slender near the head, at some distance from which a dewlap commenced. In place of the hump, the Gayal has a sharp ridge. The tail is covered with short hair, except near the end, where it has a tuft like that of the common

ox. The legs, especially the fore ones, are thick. The hinder parts are weaker in proportion than the fore one owing to the contraction of the belly. The coat color of adult gayal is black. In some adult gayal, white spotting of various degrees in different parts of the body is observed. White stocking in the lower part of the legs is present in all adult gayal. This white stocking is developed at 4 months age in gayal. The coat color of new born calf is red or coffee color. The coat color of calf is turned black after 4 months of age. The average height at wither, body length, head length, forehead breath and weight of mature bulls (5-6 years old) are 132.50 ± 1.42 cm, 132.00 ± 1.02 cm, 50.00 ± 0.00 cm, 32.22 ± 0.55 cm and 510.00 ± 16.71 kg, respectively. The average height at wither, body length, head length, forehead breath and weight of growing gayal (1-2 years old) are 120.75 ± 0.42 cm, 124.50 ± 0.25 cm, 45.50 ± 0.25 cm, 30.00 ± 0.00 cm and $2.43.33 \pm 11.96$ kg, respectively.

Distribution

Gayals are found in Northeast India, Bangladesh, northern Myanmar and in Yunnan, China. They inhabit hill-forests. In India, semi-domesticated gayals are kept by several ethnic groups living in the hills of Tripura, Mizoram, Assam, Arunachal Pradesh, and Nagaland. They also occur in the Chittagong Hill Tracts. In northern Burma, they occur in the Kachin State, and in adjacent Yunnan are found only in the Trung and Salween River basins. These animals prefer cold and mild climate and are mainly found in the tropical rain forests.

Group Name:

gang, herd, obstinacy.

Seasonal Behavior

Sedentary.

Habits and Lifestyle

Gayals are social animals and live in herds. From birth until the time of butchering or market, they remain in the herd and roam mostly freely throughout the forests. Females are usually aggressive when with calves, and there are instances known when people have been severely injured after

being gored by one. Males are usually more docile. These animals are active during the day and prefer to rest in shades in the midday.

Feeds and Feeding Behavior of Gayal

The feeds of gayal consisted of naturally grown shrubs and grass in the forest. The hill bamboo leaves and hilly grass are the main feeds. Gayal roams in the forests of hills and moves from hill to hill for browsing feeds and drinking water. In most cases, they stay in the forest even in the night. For water, they travel to small canal running through the hills. They graze for feeds in the morning and afternoon, drunk water between 10.00 am to 12.00 noon. In the noon, they took rest under trees near the water holds or nearby human dwelling. They come to the owner dwelling for feeding common salt at weekly or fortnightly interval. If the grazing place is far away from owner dwelling, the owner traveled to gayal inhabitant for feeding common salt.

Chapter: 3

Methodology

Location and agro-ecological climate

All the information was collected from Gayal farm, padua, Shukh bilsh Rangunia. It's located at southeastern hilly parts of Bangladesh and about 20 meter above the sea level. The land type is highland with strong acidic (pH 4.5-4.9) loamy soil. The rainfall and humidity vary from 255 to 1,093 mm and 85 to 95% respectively during the wet and hot period (June to October). Mean annual temperature is about 26.1°C but ranges from 11.2°C to 32.3°C.

Data collection

The data was collected from record books of Byre section of Gayal farm, Padua, sukhbilash, Rangunia with the help of Record Keeper.

Data analysis

The data were checked manually for obvious inconsistencies, recording errors or missing data. The potential errors were evaluated and corrected, if possible, following discussion with the relevant veterinarians. Data with suspicious values were excluded.

Period of data collection

For this study, data were collected at December 2019; several visits were made during the period to collect necessary data from gayal farm.

Preparation of the survey schedule

For this study survey method was followed to collect data. It is very important in any survey to prepare an interview schedule. After consulting the available literature on gayal and gayal farming and marketing of gayal and keeping the objectives of the study in view to sets of close-cum open type interview schedules. The interview schedules pretested and then prepared for survey. The schedule was prepared maintaining with the objectives of the study. Through the survey and animal recording, the following information was collected:

- Ecology and vegetation pattern of gayal.
- Morphology of gayal (Coat color, body measurement, body conformation).

- Feeds and Feeding behavior.
- Reproductive parameter.
- Incidence of diseases and fitness.
- Utility of gayal.

Data of Feeding and health management at farm

The animals are allowed to browse for about 8 h daily and were supplied with 1 kg concentrate mixture per 100 kg body weight daily. Straw, Rice polish and several concentrates are also offered on the body weight basis. Vaccines (FMD, Anthrax, HS etc.) are given for the prevention of diseases. Necessary treatments are provided against specific diseases according to the suggestions of Dr. Mohammed Harun R. Rashid (VS, Rangunia Upazilla).

Data of Reproductive character

The reproductive characteristics of the animals are closely observed and their age at first estrous, weight at first estrous age at first calving, calving interval, estrus cycle and postpartum estrus etc are recorded in a herd book. The gestation period is calculated from the date of effective natural service to the date of parturition day. Immediately after birth newborn calves are weighted to record birth weight. Gayals are not habituated to milking. Milk is served for the calves and calves are allowed to browse with their mother.

Photo gallery



Figure: Collection of data from gayal farm, Owner Ershad Mahmud Himself, A Gayal.

Chapter: 4

Result and Discussion

Age of first estrous and first conception:

The average age at first estrous and age of first conception are 750-800 days.

Weight at first estrous

The average body weight at first estrous in gayal ranges from 205 kg to 330 kg.

Length of estrous cycle and duration of heat

The average length of estrous cycle in gayal is 21 days and average duration of heat is found 40-45 hours.

Number of services per conception

Average number of services required for a successful pregnancy in natural and artificial insemination are 2. Khan (1990) reported 1.57 for Pabna cows whereas Majid et al. (1995) recorded 1.9 in Sahiwal cows, which was similar with the natural service for conception of this animal. But for a successful pregnancy by artificial insemination in gayal, number of services required was higher than those reports. Improper heat detection, lack of knowledge of the inseminator about reproductive organs of the gayal, concentration of spermatozoa per dose or incorrect insemination may be the causes of more services (artificial insemination) for a conception in this animal.

Gestation period

Average gestation period between gayal and gayal mating is 300 ± 5 days and gayal and cattle mating was 280 ± 5 days. It was observed that a longer gestation period was needed in gayal and gayal cross offspring but similar gestation period in gayal and cattle cross offspring. So, it is clear gayal fetus needs longer time for maturation than the cattle fetus.

Daily milk yield, lactational production and lactation length

The daily average milk yield, lactational production and lactation length of gayal was 305 ± 30 ml/day, 35 ± 2 kg/lactation and 110-115 days respectively.

Reproductive pattern

It was observed that highest number of calving (30%) occur during monsoon and autumn. It may be due to highest conception rate in winter (December to February) because of availability of green fodder after summer in the period of monsoon, autumn and winter which improve the live weight and health status.

Time for service

70% successful conception occur when the service given within 21-30 h (mid-estrous) of heat in natural service, where as 100% successful conception occur when the service was given artificially within 31-40 h of heat.

Reproductive problems

Irregular heat and cervicitis were found highest (25%) followed by metritis and case of abortion. Before starting artificial insemination, cervicitis and metritis was not found in this farm.

Marketing

There is no market for selling or buying gayal in Chattogram. Gayal bulls are sold between December to February and used as sacrificed animals for the Muslim religious festival called “Oros” and “Eid e Miladunnabi” organized by the Muslims. Last year at august 2019 they sold 15 gayal at Eid ul Azha and the range of price was 200000/- to 250000/- Taka. Sometimes they sell gayal on the basis of weight and in that case the price is 30000/- per 40kg.

Problem in production and marketing

The decreasing forest area and restriction of grazing in confined forest area was the main problem associated with gayal production. The lack of veterinary service as well as extension service of the government was the secondary problem. The absence of livestock market was the last problem observed during this study.

Chapter: 5

Limitations

Though the study was conducted carefully there was some limitations too. Some of the data from record book was damaged that's why we had to depend on the information from the farm manager. Some more visits in the farm could have done to observe the behavior of Gayal and collect more accurate data during the study period.

Chapter: 6

Conclusion

Gayal is a valuable animal genetic resource and also an endangered animal species of Bangladesh. A joint research finding on Gayals of Bangladesh stated that reproductive efficiency was high and calving interval was 402 days. They exhibited high disease resistance. The high growth rate and reproductive efficiency of Gayals in the home tract indicates that this species can be utilized economically if a proper breeding plan and a sound extension service can be adopted.

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Biography

Shariar kabir was born in 15th October 1995 at Rangunia, Chattogram, Bangladesh. His father's name is Mohammed Humayan Kabir and mother's name is Jasmin Akther. He passed his Secondary School Certificate (SSC) examination from Narangiri govt. High School in 2012 and Higher Secondary Certificate (HSC) examination from Govt. City College, Chattogram in 2014 Obtaining a 5 GPA in Both exams. He is a student of Doctor of Veterinary Medicine (DVM) at Chattogram Veterinary and Animal Sciences University, Khulshi, Chittagong, Bangladesh. During undergraduate period he has received clinical training on veterinary medicine from UVH, kaptai, Centarl cattle breeding farm savar, Purbachal pet hospital of CVASU, CVH, BLRI, LRI, Dhaka and Chattogram zoo etc.

His primary research interest is in wild animal specially in captive animal of zoo. Shahriar lives with his family at Chandroghona, Rangunia. In his free time, he loves to read self help books and explores the city for good non vegetarian cuisine.