

Feeding Behavior of Blackbuck, Chinkara and Spotted Deer in Captivity at Lal Sohanra National Park Bahawalpur, Pakistan

Saddam Hussain,¹ Irfan Ashraf,¹ Rabia Mehboob,¹ Sehrish Rana Rajpoot,² Muhammad Wasim Tasleem*³ and Esha Gulfreen⁴

¹Department of Forestry, Range and Wildlife Management, University College of Agriculture and Environmental Sciences, Islamia University of Bahawalpur, Bahawalpur, Pakistan

²University College of Conventional Medicine, Islamia University Bahawalpur, Bahawalpur, Pakistan

³Department of Zoology, Islamia University Bahawalpur, Bahawalpur, Pakistan

⁴Department of Zoology, University of Agriculture Faisalabad, Faisalabad, Pakistan

ABSTRACT

Lal Sohanra National Park is one of the important protected areas of Pakistan. From many years endangered species of deer are being raised in captivity at Lal Sohanra National Park. In this study, we have observed the blackbuck, chinkara and spotted deer which are highly endangered. The findings of study showed that blackbuck, chinkara and spotted deer eat daily any of the seasonal grasses like e.g., Maize (*Zea mays*), Jantar (*Sesbania bisbinosa*), Berseem (*Trifolium alexandrinum*) Bajra (*Pennisetum glaucum*) 4 to 6 kg, 3-5 kg and 4-5 kg respectively. Softened parts of the plants were also being eaten, which included Jandi (*Prosopis spicigera*), Kikar (*Acacia* sp.), Sheesham (*Dalbergia sissoo*), Lamb (*Aristida depressa*), Gorkha (*Lasiurus hirsutus*), Khawai (*Cymbopogon jawarancusa*), Murat (*Panicum antidotale*), Dhaman (*Cenchrus pennisetiformis*), Lana (*Haloxylon recurvum*), Ber (*Zyziphus* sp.), Katran (*Cymbopogon martinii*), Khiri (*Euphorbia prostrata*), Khip (*Leptadenia pyrotechnica*), Chag (*Crotalaria burhia*), Dele (*Capparis decidua*), Phel (*Neslia* sp.), Ghandeel (*Eleusine flagillifera*), Ak (*Callotropis* sp.) and Jal (*Salvadora oleoides*). While the all showed the similar amount of parched channa consumption. Softened plant parts of various species were also being given in their feeding. It is concluded that these species can live on the variety of fodders where the deer eat little amount of grass in a single day for survival as compared to other fodder types.

KEY WORDS: BLACKBUCK, CHINKARA, FEEDING BEHAVIOR, LAL SOHANRA NATIONAL PARK, SPOTTED DEER.

INTRODUCTION

Pakistan is a country which includes a wide range of environmental conditions starting from Karakorum, Himalayan, Hindu Kush, Indus plains, coastal halts and desert variations to the second highest peak in the world (K2) in the North to Southern sea levels. Pakistan has a rich variety of its fauna and flora, as well as other wildlife habitats and related landscapes. Continuing to be a special and enticing biodiversity artistic endeavor, in Pakistan the species come primarily from Ethiopia since its transitional zone is flanked by two of the six most important

zoogeographic zones, the Palearctic and also the Oriental. The National Parks management, through the protection of ecosystems and threatened species, has an important role in biodiversity conservation. It also serves as a fauna and flora reservoir that can restore lands where numerous species have vanished (Chishty et al. 2021).

On 26 October 1972, Lal Sohanra National Park (LSNP) was declared a National Park by government following a 1971 Wildlife Enquiry Committee recommendation. It originally occupied a land of 313.549 km² from which the desert occupied 209,319 km², the forest plantation covered 84.880 km² and the forestry reservoir was 19.339 km² and was expanded to 226.80 km². It is known for its diversity of animals that obviously includes Black buck, Antelope

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Nilgai and Rhino. LSNP is Pakistan 's primary biosphere reserve (Salahud et al. 2021).

The UNESCO-recognized "Human and Biosphere" (MAB) plan for sustainable development includes biosphere reserves. These are suitable for researching and demonstrating groundbreaking sustainability methodologies between local and international norms. Such biosphere reserves are capable of performing three related purposes- conservation, growth and research (UNESCO 2011). The large lake in the center of the park is a wonderful wintering ground, ideal for bird-watching (Maan and Chaudhary 2001; Roy and Mistry 2021).

Black buck (*Antilope cervicapra*) belongs to the Antelope genus that has been observed in Cholistan. It was recognized as among the most graceful animals, as a native Cholistan species. Female Blackbucks need large grasses as well as small bushes to supply fawns (Roy and Mistry 2021). In the first week, the fawns lie in the grass and bush and the nursing mothers go to the nurseries within a few hours. Fawns are very weak and can be quick to be predated within the first few weeks. For the proper growth of young Blackbucks, therefore, it is important to also have undisturbed open spaces with the small covers and grass covers. At the age of around two weeks, the fawns join mother as well as other groups (Khan and Khan 2018; Rai 2021).

The Chinkara (*Gazella gazella*) is another important species of deer family, inhabiting the LSNP. The failure to maintain some reticulo-rumen cellulolytic bacteria that promote digestion of fibrous feed is due to the preferences of foods with low fiber leaves and high nutrient requirements. Found in Cholistan, Chinkara consumes fruits of plants, leaves and flowers. It only grazes in the night and can cover several kilometers before it comes back to the desert early in the morning. In winter, it always prefers desert grasses, but feeds on the green *Calligonum polygonoides* as well as *Acacia jacquemontii* leaves. Food also comes from crops grown such as Brassica sp., Sorghum sp. As well as Sorghum sp (Salahud et al. 2021).

The Spotted Deer (*Axis axis*), often referred to as Chital, is a universal representative of deer family which is present in India and Pakistan region. It is found throughout the whole area except for in the farthest north. Spotted deer is considered as grazers and also browsers. In the morning and at night, they sleep, rest mostly in heat of midday. They eat almost every kind of plants, but their favorite diet is grass. A curious behavior is that this animal also consumes antlers for its rich nutrients. These are very afraid and anxious creatures who keep an eye on chasing predators at all times. Between summers and winters, they are bred twice a year, most usually in summer (Roy and Mistry 2021). The aim of present study feeding behavior of blackbuck, chinkara and spotted deer in captivity at Lal Sohanra national park Bahawalpur, Pakistan.

MATERIAL AND METHODS

The present study was conducted in Lal Sohanra National Park (29024'N-72001'E), which is located in the east of

Bahawalpur, approximately 36 kms away in the province of Punjab (Khan et al. 2018). 2 distinct sites (S 1 and S 2) have been selected for the current research. The study was conducted during the months of January to June, 2020. The blackbuck, chinkara and spotted deer in captivity were observed for their feeding behavior. The weight of fodder was measured by weighing machine and the data on types of fodders were collected on daily basis. The use of different fodders were also weighed and noted. The data of six month was collected and their averages were measured using Software / excel for different types of fodders and relative use. The different vegetation types which were the flora of this area were also recorded, when these plants were offered to the different species of deer.

RESULTS AND DISCUSSION

Lal Sohanra National Park is an important protected area present in Bahawalpur district of Punjab, Pakistan. This Park contains important mammal species which is considered endangered in other parts of the world. Blackbucks (*Antilope cervicapra*), Chinkara (*Gazella gazelle*) and Spotted deer (*Axis axis*) are some of the important mammal species of LSNP. Study indicated that Blackbucks, Chinkara and spotted deer consume fodder of seasonally grasses (Maize; *Zea mays*, Jantar; *Sesbania bisbinosa*, Burseem; *Trifolium alexandrinum*, and *Bajra*; *Pennisetum glaucum*) of 4-6 kg, 3-5 kg, 4-5, kg each individual in a day respectively. Also, it has been observed that parched channa was also being consumed with total amount of 250 to 500 g. Grasses that grow after the rain in enclosures were also used for feed. Most of the area of enclosure has become barren due to fast grazing. Soft bark trees, branches and fallen leaves were also used, along with softened parts of the plants including Jandi (Botanical name: *Prosopis spicigera*), Kikar (*Acacia* sp.), Sheesham (*Dalbergia sissoo*), Lamb (Aristida depressa), Gorkha (*Lasiurus hirsutus*), Khawai (*Cymbopogon jawarancusa*), Murat (*Panicum antidotale*), Dhaman (*Cenchrus pennisetiformis*), Lana (*Haloxylon recurvum*), Ber (*Zyziphus* sp.), Katran (*Cymbopogon martinii*), Khiri (*Euphorbia prostrata*), Khip (*Leptadenia pyrotechnica*), Chag (*Crotalaria burhia*), Dele (*Capparis decidua*), Phel (*Neslia* sp.), Ghandeel (*Eleusine flagillifera*), Ak (*Callotropis* sp.) and Jal (*Salvadora oleoides*).

A previous study has also present on deer raising in Cholistan desert by Khan and Khan (2016) and they suggested that mainly semi-arid as well as arid Pakistan is marked by low soil humidity as well as floral cover. A few other areas, such as Cholistan, in which economic choices are extremely limited, are extremely arid. No other activity in this part of the word is profitable in the present geographical place, except the growing of those animals which in arid conditions can thrive better. Together with other livestock, such as sheep, goats and camels, Cholistan 's climate allows deer to be raised. Promoting this exercise in the area can prove to be a perfect moonlighting business in several ways (Bhaskar et al. 2021).

In addition to providing people with an excellent source of income, it meets the increasing demand for meat. Deer meat is very common with many people, particularly those

of the upper economy with high purchasing power. So, deer farming will serve as a boost to Cholistan's economic circumstances. Deer farms along with goat, sheep as well as cattle farms can originally be established as limited enterprises. Owners can start up as a small business while still keeping a full-time job elsewhere. Deer herds require much less care and space than conventional live herds. Deer farming is on the other hand in a fragile condition everywhere practiced. Cholistan is some kind of region in which geographical circumstances allow this sector to develop as well as manage much better (Arandhara et al. 2021). Their study examines various aspects with possible futures of deer farming in the Cholistan desert, based on data gathered during field visits to Cholistan and various secondary sources (Arandhara et al. 2021).

It also provides a short spacious time view with deer farming around the world utilizing theoretical approach. It shows that certain deer species, including Chinkara, Chital and Blackbuck, can survive well in Cholistan, which can be comparatively cheaper than those of other animals (De et al. 2021). Feeding behavior of Blackbucks, Chinkara and Spotted deer is quite same. Although their amount given at a time may vary. So, from study indicated that Blackbucks consume Fodder of 4 to 6 kilograms per Blackbuck in a day. Also, it has been observed that parched channa was also being consumed with total amount of 250 to 500 g. but in case of Chinkara, they consume Fodder of total amount 3 to 5 kg and parched channa 250 to 350 g per Chinkara in a day. And in case of Spotted deer, they were consuming the same amount of Fodder (3 to 5 kg) and parched channa (250 to 350 kg) as it was given to the Chinkara because they inhabit the same enclosure (De et al. 2021).

Table 1. Food supplements and their quantity of Blackbuck, chinkara and spotted deer

Sr. No.	Common name	Botanical name	Black buck	Chinkara	Spotted deer
1	Maize	<i>Zea mays</i>	4-6 kg	3-5 kg	4-5 kg
2	Jantar	<i>Sesbania bisbinosa</i>			
3	Burseem	<i>Trifolium alexandrinum</i>			
4	Bajra	<i>Pennisetum Glaucum</i>			
5	Parched channa	<i>Cicer arietinum</i>	250-500 gm	250-350 gm	250-350 gm

Table 2. Common and Botanical names of the Vegetation

Sr. No.	Common name	Botanical name
1	Jandi	<i>Prosopis spicigera</i>
2	Kikar	<i>Acacia sp</i>
3	Sheesham	<i>Dalbergia sissoo</i>
4	Lamb	<i>Aristida depressa</i>
5	Gorkha	<i>Lasiurus hirsutus</i>
6	Khawai	<i>Cymbopogon jawarancusa</i>
7	Murat	<i>Panicum antidotale</i>
8	Dhaman	<i>Cenchrus pennisetiformis</i>
9	Lana	<i>Haloxylon recurvum</i>
10	Ber	<i>Zyziphus sp.</i>
11	Katran	<i>Cymbopogon martini</i>
12	Khiri	<i>Euphorbia prostrata</i>
13	Khip	<i>Leptadenia pyrotechnica</i>
14	Chag	<i>Crotalaria burhia</i>
15	Dele	<i>Capparis decidua</i>
16	Phel	<i>Neslia sp</i>
17	Ghandeel	<i>Eleusine flagillifera</i>
18	Ak	<i>Callotropis sp.</i>
19	Jal	<i>Salvadora oleoides</i>

The food habits of Blackbucks have indicated that on average a Blackbuck consumed around 7 lb (3-2 kg) per animal of fodder and maize per day. By taking into account the growth and development of plant and animals, a 1 acre

(4,047 sq m) of desert will sustain 16.7 livestock and a 1 acre (36.6), for one day. The planned 1,280 acres enclosure includes 63% desert and 37% woodland, which are expected to be around 88 animals each year using those statistics (Bist et al. 2021). This is obviously an easy solution, but there was no time to get plant growth and die-off estimates. In addition, a large plant was palatable, but it's not very preferred. In Bharatpur, Rajasthan (India) and Kanha Park, Blackbuck have rarely been found to be navigated, because there was a lot of grass. Of course, they preferred certain grass not inevitably consumed in relation to the amount available: for example, *Haloxylon recurvum*, an abundant species, ate grass especially when woody plants were not readily accessible. Continuous heavy pasture and navigation will decrease annual plant growth and many of the most favored plant species will eventually vanish, leaving less food sources with likely lower nutritional content as has been reasoned by De et al. (2021). The carrying capacity of an enclosure may therefore be reduced. 'Imported' protein and other nutrients are greater in the fodder and maize than natural plants available (Sharma 2021).

CONCLUSION

The findings of the present study has concluded that these species can live on the variety of fodders. And all the deer eat little amount of grass in a single day for survival. These species had a very expensive meat value so we can rare them on little expenses.

Data Availability Statement: The database generated and /or analysed during the current study are not publicly

available due to privacy, but are available from the corresponding author on reasonable request.

Conflict of Interest: There is no conflict of interest.

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