Original Research Article

STUDIES ON THE BEHAVIORAL IMPACT OF VISITORS AND FEEDING MANAGEMENT IN HOG DEER (*AXIS PORCINUS*) KEPT AT JALLO WILDLIFE PARK, LAHORE

Ali I[1], NOREEN M[1], RASHEED S[2], HUSSAIN A[2], SAEED I[2]

[1]*School of Zoology, Minhaj University Lahore, Pakistan*
[2]*School of Food Science and Technology, Minhaj University Lahore, Pakistan*
*Corresponding author email address: Iftikharalidr55@yahoo.com

Abstract *This study was conducted to observe the behavioral impact of visitors and feeding management in Hog Deer (Axis porcinus) kept at Jallo Wildlife Park, Lahore. In this study, 20 animals of hog deer approximately of the same age of both sexes were included. The animals were divided into four experimental groups consisting of five animals (Hog Deer) in each group such as Group A (Control) with addition of no formulated feed, Group B containing 0.25 kg formulated feed per animal per day, Group C containing 0.30 kg formulated feed per animal per day, Group D containing 0.40 kg formulated feed per animal per day. The animals were fed in groups of five in each stall with a combined feeding pen. A composite feed /ration was prepared mechanically at the farm and was offered to the animals. This experiment was comprised in the 8th week. The feeding behavior and the weight gain were recorded weekly. After the complication of experiments highest growth was observed in Group D animals supplemented with 0.40 kg/animal/day formulated feed. The obtained result showed that high visiting of humans change the feeding behavior of Hog Deer as they mostly showed high locomotion instead of feeding. It is suggested that proper management care is required to keep the hog deer in healthy conditions during captivity and avoid overcrowding of visitors for negative influence on their habitat and feed.*

Keywords*: Hog Deer; Formulated Feed; Weight Gain; Visiting Behavior*

Introduction

Hog deer (*Axis porcinus*) is regarded as a threatened species in Pakistan, extinct in many places with gradual decline in other places. Wildlife enthusiasts have a feeling that the hog deer population is fast declining in Pakistan but no reliable data is available to support this notion and the status of hog deer was declared an endangered species. Hog deer (Axis porcinus) are ungulates. Hog deer are usually found in the Northern parts of India. This deer was introduced initially in Australia and the United States. In the winter, the Hog Deer's coat is typically dark-brown, with lighter patches on the undersides of the body and legs. The deer of this species have short legs and a robust body. Males have substantially broader necks and are heavier than females. In the summer, females are reddish-brown, lightening in the winter. Antlers are only found in males. Deer stags weigh 50 kg and stand about 70 cm tall at the shoulder. Herbivores are hog deer. Many studies have shown that stress reduction in deer is a top priority due to little human interaction with the animals. Additionally, every individual is visually checked roughly every third day, or more frequently if an unusual behavior in the animal is noticed. (Brucks, Drews and Ulbrich, 2022). Deer have a typical ruminant digestive system requiring similar nutrients and Micronutrients to other ruminants such as cattle and sheep. The daily ratio for each adult hog deer is 0.750 kg of concentrate deer mash in addition to grass and green fodder given ad-lib. The diet of this animal is composed of grasses, supplemented with other plants as well as leaves, young grasses, herbs, flowers, and fruits. However, wild animals have distinct behavioral preferences for particular feed items, thus while planning their diet in captivity, it is important to take these considerations into account. Hog deer prefer to live in locations where there is no human interference with the ecosystem and there are few disturbances at night, especially during the hot and rainy seasons. Due to pressure from hunters, it tends to grow more nocturnal and solitary depending on the location and surroundings (Zakir *et al*., 2021).

The hog deer population is nonexistent in agricultural and densely populated areas, it has been split inside secure zones due to the removal and removal of grass fields. The long-term viability of this small number of hog deer in this region appears dubious given the synthetic pressures and the normal practices. Deer will "pronk" to alert a predator that it

has been spotted, and warn other deer of danger; sometimes pronking is used when moving uphill. Pronking is a movement best described as a bounce, with all four feet off the ground at the same time. Deer are creatures of habit and will often create well-worn footpaths between favored resting and feeding sites. To properly manage the hog deer population, urgent maintenance needs to be made under scientific monitoring (Shahbaz, Munir *et al.,* 2021). Male deer roar in several ways during rutting season, depending on the class; these yells not only reveal a lot about the caller but, under some circumstances, can also trigger an estruses response in females. Furthermore, mothers and their young use a variety of sounds, from low-pitched "pheep" cries to loud panic screams that can draw a large number of mothers (all of which have young in the area) to the scene. (Khattak, Liu *et al.,* 2021).

The times at which the feeding and activity of hog animals such as deer occur vary depending on the weather and the season of the year. Warm to hot days the hog deer become active as early as 6.00 am, however, if it is cold, there may not be much movement before 9.00 am. If deer are undisturbed and the weather conditions favorable, they will feed further out into the open as the morning progresses, they tend to alternate between resting and feeding periods. Hog deer do not graze only in one area. Alternatively, they will feed intermittently throughout the day and move from area to area with feeding peaks occurring immediately after dark and just before dawn. In general, they prefer not to feed in open extreme heat and are not active during periods of heavy rain. This type of weather sends them undercover. Hog deer are normally thought to be a solitary species (Mayze & Moore, 2019).

Materials and methods

Location and Duration of Study

The proposed study was conducted at the Jallo Wildlife Park, Lahore on the hog deer. The public recreation and wildlife park known as Jallo Park was created in 1978 and is located in the Lahore District of Punjab, Pakistan. It stands for Wildlife Park and covers an area of 461 acres. The experiment has lasted for 2 months. The Assistant Director of this

park and the labor helped the researcher to conduct this study.

Experimental Design

The experiment was consisted of two aspects studying the feeding and visitor behaviors of hog deer. To observe feeding behavior, 20 animals of hog deer approximately of the same age of both sexes were included in the study. Experimental animals included both sex's males and females of different weights. Adult male hog deer weights ranged between 30 – 50 kg and the average weight of males was 42 kg. While the female hog deer weight was between 36-38 kg. All the experimental animals were dewormed with locally available Dewormers (Nilverm) and proper vaccination before the start of the experiments. The animals were divided into four experimental groups consisting of five animals (Hog Deer) in each group. The dietary treatment groups included Group A (control) where no addition of formulated feed was done, Group B contained 0.25 kg of formulated feed per animal per day, Group C contained 0.30 kg of formulated feed per animal per day, Group D contained 0.40 kg formulated feed per animal per day. The hog deer animals were served in groups of five in a collective feeding stall. A composite feed /ration was prepared mechanically at the farm/station as per the details given in below Table 1.

Table 1 Name of Ingredients and their Percentage used for Feeding of Animals (Hog Deer)

Sr.No.	Name of Ingredients	Percentage Used
1.	Crushed Maize grains	15
2.	Crushed Wheat grains	7
3.	Soya Bean Meal (SBM)	20
4.	Sun Flower Meal (SFM)	15
5.	Wheat Bran	25
6.	Rice Polish	15
7.	Mineral Mixture	2
8.	Salt	100

Four groups of animals were given feed/ ration thus formulated in addition to usual fodder being offered/ fed to hog deer kept at the said park. At the rate of

3-4kg per head per day. The animals were fed in groups of five deer in each separate feeding through. Each group of animals/ deer was offered prepared

feed as per Table 2 given below in addition to the usual fodder being offered to them.

Table 2 Feeding regime of animals daily in addition to usual fodder

1. Group A   0.00 kg/head/day (Control)
2. Group B   0.25 kg/head/day
3. Group C   0.30 kg/head/day
4. Group D   0.40 kg/head/day

Between 9 am and 6 pm each day, the specially made meal was given out. All animals had unrestricted access to fresh water. The animals were weighed and grouped before being placed in the stalls, taking into consideration their various body types so that the normal weight of a respective group of animals was nearly the same. Using an electronic scale, each animal was weighed separately. Separate feeding troughs were used to feed each group of animals separately. To determine the effectiveness of the feeding program and the animals' weight increase, each animal was weighed every week along with the feed it accepted and rejected daily.

Growth Performance and Feed Intake

Each group's information on weight increase and feed effectiveness was collected weekly. The animals were accurately weighed on an electronic scale, and the formula below was used to compute the average daily increase for each group of animals.

$$ADG\ (gm/day) = \frac{Change\ in\ weight\ during\ the\ study\ period\ (gm)}{No.of\ Days\ of\ study\ period}$$

To determine the feed efficiency, feed was regularly weighed daily together with feed that was rejected. The method below was used to elaborate on the calculation of feed efficiency and dry matter intake

$$DMI\ (gm/day) = \frac{Total\ feed\ consumed\ during\ the\ study\ period\ (DM)\ in\ gm}{No.of\ Days\ of\ study\ period}$$

Visiting Behavioural Observations of Hog Deer's

The other aspect of the experiment was conducted by observing the behavior of animals towards the

visitors physically by observing their habits for running, frightening and avoiding feed, etc during visiting hours from 10 am to 2 pm weekly for two months. The animals were observed for their nervousness, alertness, and social contact with people during crowd-watching.

Individually identifiable male hog deer were the subjects of behavioral observations to collect information on their dominance status and mating strategies. Together the aforementioned data, the animals were monitored. The research scholar noted each habit of animals at visiting hours and compared these habits with their normal lifestyle in captivity. The data was gathered by a single focal person so that the animals wouldn't be startled by the researcher and could go about their daily behavioral tasks as usual.

Statistical Analysis

ANOVA was used to examine the collected data and make assumptions about the outcomes. The analysis was done through SPSS and prism-graphpad software of the computer.

Results

As described earlier in the present study, I noticed the feeding behavior of the hog deer and the weight gain of the animals. Four groups of animals were given formulated feed except for the control group and weight gain of animals was observed.

Weight Gain

Formulated diet in addition to usual fodder being offered to hog deer. Water was available at all times, and the animals received seasonally available food in addition to a natural salt stone to provide their mineral needs. The initial weight of the animals ranged from 36-38 kg. The weight gain of the animals weekly is presented in the below table 3 and 4.

Table 3 Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 1st Week

Feed Per animal/ kg/day	Best fit value	Std. Error	95% Confidence Interval forMean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.05350	0.26930	0.6388	0.7458	0.007830	**0.8504**
0.25	0.08607	0.22540	0.4935	0.6656	0.028330	**0.7183**
0.30	0.34320	0.25570	0.2884	0.9748	0.28070	**0.2213**
0.40	**0.00571**	**0.17580**	**0.4462**	**0.4576**	0.000213	0.9753

P value is > 0.05 in all groups showing that results were statistically non-significant.

The standard error of weight gain for Group-1 (Control) (0 kg/animal/day) =0.26930
The standard error of weight gain for Group-2 (0.25 kg/animal/day) = 0.22540
The standard error of weight gain for Group-3 (0.30 kg/animal/day) =0.25570
The standard error of weight gain for Group-4 (0.40 kg/animal/day) =0.17580

Table 4. Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 2nd week

Feed Per	Best fit value	Std.	95% Confidence Interval forMean	Goodness of fit	Sig. Value

animal/ kg/day		Error	Lower Bound	Upper Bound	(R²)	
0.00	0.02811	0.16282	0.6123	0.6581	0.09282	**0.1967**
0.25	0.02617	0.17293	0.4182	0.5632	0.01782	**0.128**
0.30	0.0271	0.18293	0.2276	0.3348	0.17389	**0.1823**
0.40	**0.00271**	**0.01272**	**0.1728**	**0.2417**	**0.01928**	**0.1994**

P value is > 0.05 in all groups showing that results were statistically non-significant

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The results suggest that the linear relationships between the variables X and Y for all groups are not statistically significant. The R² values are very low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X). The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes. In essence, the linear regression lines for these groups do not adequately explain the variability in the data, and the relationships between the variables are not statistically significant (Table 5).

Table 5. Statistical Representation Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 3rd week

Feed Per animal/kg/ day	Best fit value	Std. Error	95% Confidence Interval forMean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.04779	0.2684	0.6421	0.7377	0.0063	**0.8657**
0.25	0.08607	0.2254	0.4935	0.6656	0.02833	**0.7183**
0.30	-0.3425	0.2459	0.2896	0.9746	0.2795	**0.2224**
0.40	**0.0075**	**0.1748**	**0.4417**	**0.4567**	**0.0003683**	**0.9674**

P value is > 0.05 in all groups showing that results were statistically non-significant

The results suggested that the linear relationships between the variables X and Y for all groups are not statistically significant.
The R² values are quite low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X). The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes. The Runs Test results also suggest that the data's deviation from linearity is not statistically significant. In essence, the linear regression lines for these groups do not adequately explain the variability in the data, and the relationships between the variables are not statistically significant (Table 6).

Table No 6. Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 4th week

Feed Per animal/ kg/day	Best fit value	Std. Error	95% Confidence Interval forMean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.0535	0.2693	0.6388	0.7458	0.00783	**0.8504**
0.25	0.08393	0.2254	0.4955	0.6633	0.02698	**0.7249**
0.30	0.3418	0.2457	0.2899	0.9735	0.279	**0.223**
0.40	**0.00964**	**0.175**	**0.4402**	**0.4595**	**0.0006068**	**0.9582**

P value is > 0.05 in all groups showing that results were statistically non-significant.

The results suggested that the linear relationships between the variables X and Y for all groups are not statistically significant. The R² values are quite low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X). The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes. The Runs Test results also suggest that the data's deviation from linearity is not statistically significant.
In essence, the linear regression lines for these groups do not adequately explain the variability in the data, and the relationships between the variables are not statistically significant (Table 7).

Table 7. Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 5th week

Feed Per animal/kg/day	Best fit value	Std. Error	95% Confidence Interval forMean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.0433	0.2598	0.6235	0.7367	0.00672	**0.7203**
0.25	0.07265	0.2321	0.4835	0.6455	0.02593	**0.6138**
0.30	0.3324	0.2355	0.2721	0.9837	0.289	**0.125**
0.40	**0.00871**	**0.1652**	**0.4309**	**0.4498**	**0.0005067**	**0.453**

P value is > 0.05 in all groups showing that results were statistically non-significant

The results suggested that the linear relationships between the variables X and Y for all groups are not statistically significant.The R² values are quite low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X).The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes.The Runs Test results also suggest that the data's deviation from linearity is not statistically significant.

In essence, the linear regression lines for these groups do not adequately explain the variability in the data, and the relationships between the variables are not statistically significant (Table 8).

Table 8 Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 6th week

Feed Per animal/kg/day	Best fit value	Std. Error	95% Confidence Interval forMean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.0355	0.2378	0.4738	0.6862	0.06876	**0.3586**
0.25	0.0627	0.1563	0.4955	0.6184	0.02265	**0.3254**
0.30	0.3268	0.1342	0.2899	0.9165	0.187	**0.122**
0.40	**0.09243**	**0.134**	**0.4402**	**0.4582**	**0.006253**	**0.4121**

P value is > 0.05 in all groups showing that results were statistically non-significant.

The results suggested that the linear relationships between the variables X and Y for all groups are not statistically significant.The R² values are quite low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X).The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes.The Runs Test results also suggest that the data's deviation from linearity is not statistically significant.

In essence, the linear regression lines for these groups do not adequately explain the variability in the data, and the relationships between the variables are not statistically significant (Table 9).

Table 9. Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 7th week

Feed Per animal/kg/day	Best fit value	Std. Error	95% Confidence Interval for Mean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.0245	0.1492	0.4218	0.4398	0.0827	**0.1826**
0.25	0.1487	0.1597	0.3822	0.5487	0.1563	**0.1739**
0.30	0.2146	0.1627	0.2798	0.5643	0.122	**0.1638**
0.40	**0.1862**	**0.143**	**0.3362**	**0.3985**	**0.07382**	**0.1837**

***P value is > 0.05*** in all groups showing that results were statistically non-significant

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The results suggested that the linear relationships between the variables X and Y for all groups are not statistically significant.The R² values are quite low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X).The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes.The Runs Test results also suggest that the data's deviation from linearity is not statistically significant.

In essence, the linear regression lines for these groups do not adequately explain the variability in the data, and the relationships between the variables are not statistically significant (Table 10).

Table 10. Statistical Representation of Weight Gain (Kg) of Hog Deer after Addition of Formulated feed 8ᵗʰ week

Feed Per animal/kg/day	Best fit value	Std. Error	95% Confidence Interval for Mean		Goodness of fit (R²)	Sig. Value
			Lower Bound	Upper Bound		
0.00	0.02622	0.1839	0.2372	0.4162	0.02838	**0.1524**
0.25	0.08241	0.1839	0.1871	0.3426	0.01839	**0.1927**
0.30	0.27498	0.02512	0.26187	0.7241	0.83892	**0.1792**
0.40	**0.01625**	**0.012**	**0.3785**	**0.4285**	**0.028167**	**0.1823**

P value is > 0.05 in all groups showing that results were statistically non-significant

The results suggested that the linear relationships between the variables X and Y for all groups are not statistically significant. The R² values are quite low, indicating that the variability in the dependent variable (Y) is not well explained by the independent variable (X). The confidence intervals for the "Slope" include zero, which further supports the lack of statistical significance in the slopes. The Runs Test results also suggest that the data's deviation from linearity is not statistically significant. In essence, the linear regression lines for these groups do not adequately explain the variability in the data,

and the relationships between the variables are not statistically significant (Figure 1).

After completion of eight-week research, I compared the weight of 8ᵗʰ week with first week's average weight of all animals of all groups

Weight gain after completion of research

Group A (control)	**0.910 kg**
Group B (0.25 kg/head/day)	**1.287 kg**
Group C (0.30 kg/head/day)	**1.974 kg**
Group D (0.40 kg/head/day)	**2.452 kg**
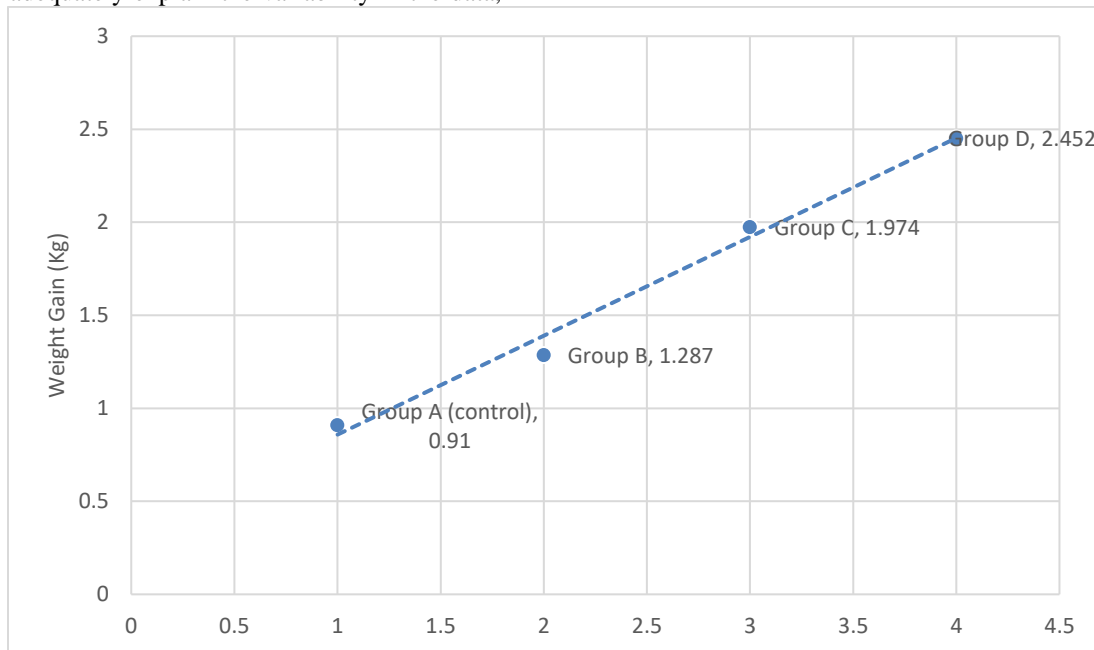
Figure 1. Total Weight Gain (Kg) of Hog Deer after Addition of Formulated feed

Visiting Behavior of Hog deer

In this section, I investigated the behavior of the hog deer with visitors of the park by physically observing their habits for running, frightening and avoiding feed etc. during visiting hours from 10. AM to 2.00 PM on weekly basis for two months. The animals were observed for resting, locomotion, feeding, reproductive and agonistic behaviors, nervousness, and social contact with the people. The data on these aspects are shown in respective tables and graphs (Table 11; Figure 2).
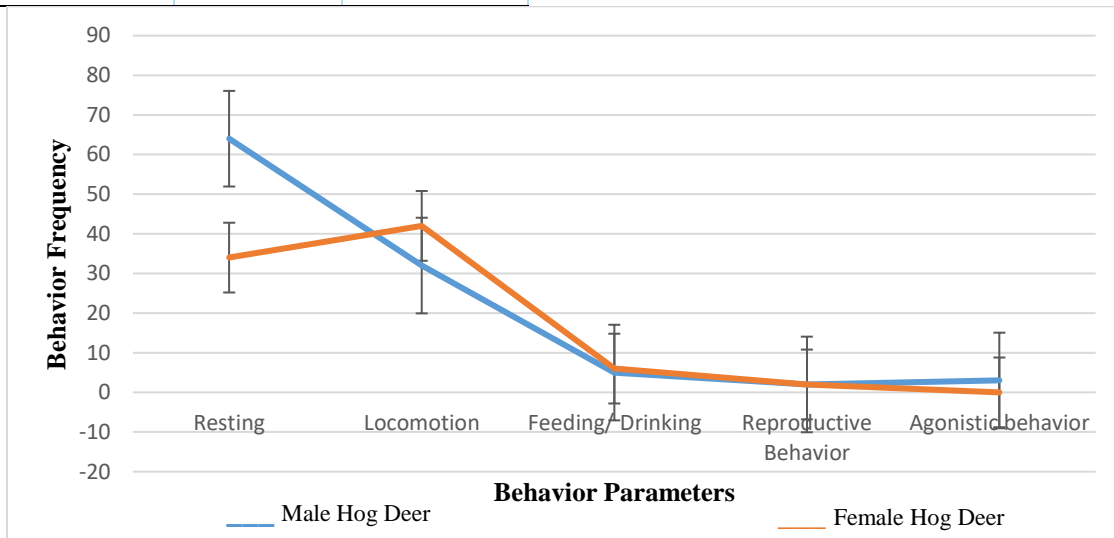
Table 11. Effect of First and Second weeks of Visitors on different Behavioral Parameters of Hog Deer

Behavioural parameters	Male Hog Deer (%)	Female Hog Deer (%)
Resting	65	35
Locomotion	33	43
Feeding/ Drinking	6	7
Reproductive	3	3

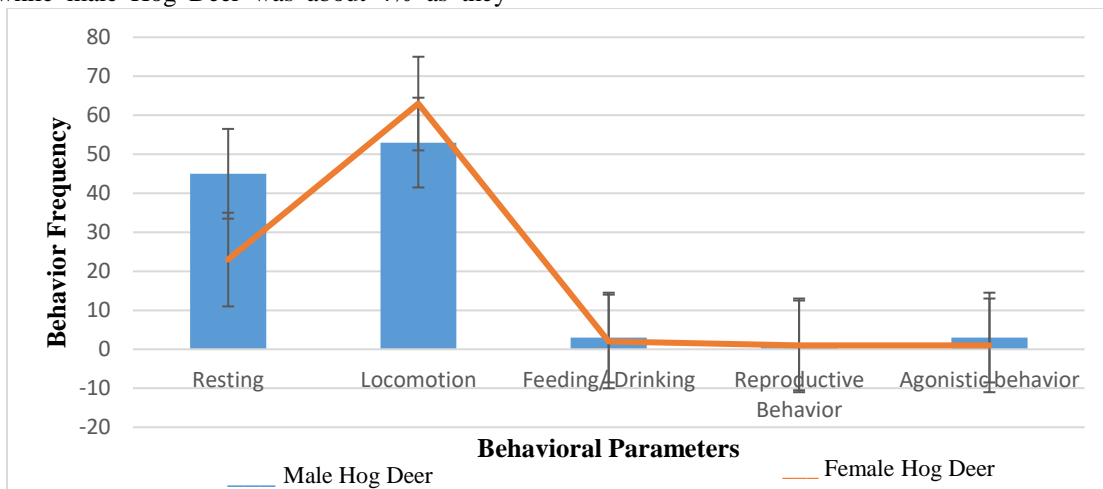| Behavior			Behavior		
Agonistic	4	0			

Figure 2. Effect of First and Second weeks of Visitors on different Behavioural Parameters

Table 11 and figure2 showed the effect of the first and second weeks of visitors on different behavioral parameters of Hog Deer at Jallo Wildlife Park. The male Hog Deer showed 65% resting behavior while the female showed 35 % of this behavior. This might be due to their involvement in seeking hide or acclimatization to visitors or their enclosure site. Female Hog Deer also showed kidding behaviour which means they have to protect their kids. In the first and second weeks of visitors, male hog deer showed 33% locomotive behavior while female Hog Deer showed 43% locomotion which might be due to nursing and guarding of their kids while the feeding and drinking behavior by the males was 6% and the female was 7% almost the same showing that they had an equal opportunity for drinking and feeding sites. Agonistic interaction by female Hog Deer was zero while male Hog Deer was about 4% as they

were more aggressive than females as they fight with their horns.

Table 12. Effect of Third and Fourth weeks of Visitors on different Behavioral Parameters of Hog Deer

Behavioral Parameter	Male Hog Deer	Female Hog Deer
Resting	46	25
Locomotion	54	65
Feeding/ Drinking	4	5
Reproductive Behavior	2	2
Agonistic Behavior	4	3

Figure 3. Effect of Third and Fourth weeks of Visitors on different Behavioural Parameters of Hog Deer

On the third and fourth weeks of visitor's behavioral parameters of hog deer at Jallo Wildlife Park are shown in Table 12 and Figure 3 where the resting behavior showed by the male deer was 46% while

the females, was 25%. The males showed 54% locomotive behavior and the female deer showed 65% of this behavior. Similarly, the feeding behavior of the male and female deer was noticed as almost equal in percentage i.e., 4 and 5 percent showing an equal opportunity for feeding and drinking. The

reproductive behavior shown by the male and female as they are equal as there were the two adult males and one female when reproductive attempts for mating were made. The agnostic behavior was more in males compared to females being more aggressive.

Table 13. Effect of Fifth and Sixth week of Visitors on different Behavioral Parameters of Hog Deer

Behavioural Parameters	Male Hog Deer	Female Hog Deer
Resting	13	10
Locomotion	69	84
Feeding/ Drinking	2	5
Reproductive Behavior	1	2
Agonistic Behavior	2	1
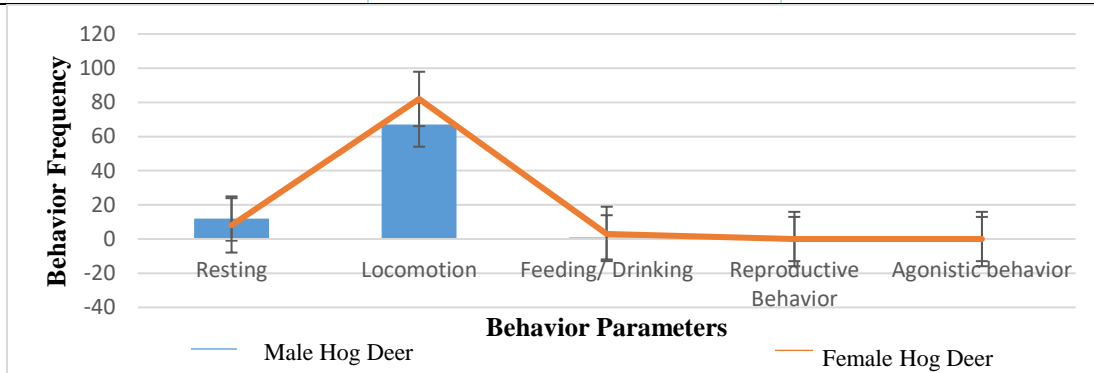
Figure 4. Effect of Fifth and Sixth week of Visitors on different Behavioral Parameters of Hog Deer

On the Fifth and Sixth weeks of visitors, the behavioral parameters of hog deer at Jallo Wildlife Park are shown in Table 13 and Figure 4. The male hog deer showed 13% resting behavior and the female showed this behavior at 10%. The male and female Hog Deer both showed reduced resting behavior during this period while the locomotive behavior was maximum (69 vs. 84) in both males and females due to the disturbance and the noise made by the children and the other voices created by

the visitors. The animals were under stressful conditions and this led to less reproductive interaction during the high rush of visitors, it means that one should have to maintain a maximum distance between the visitors and the deer enclosures so that they can perform normal behaviour activity This is very helpful for successive captive management of the deer and the high disturbance level created by visitors caused a high level of disturbances in deer.

Table 14. Effect of Seventh and Eighth Week of Visitors on different Behavioral Parameters of Hog Deer

Behavioural Parameters	Male Hog Deer	Female Hog Deer
Resting	44	14
Locomotion	69	37
Feeding/ Drinking	5	8
Reproductive Behavior	3	7
Agonistic Behavior	7	3
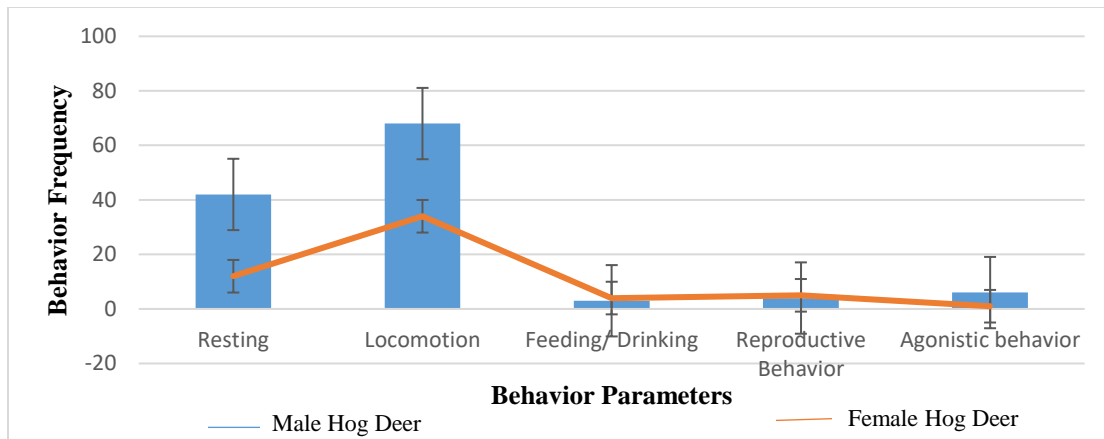
Figure 5 Effect of Seventh and Eighth Week of Visitors on different Behavioral Parameters

Table 14 and picture 5 in the Jallo Wildlife Park exhibit visitor data on the seventh and eighth weeks of hog deer behavior. The Lahore Jallo Wild Park experienced an extremely high density of visitors during this time because it was the winter vacation season. As a result, people flocked there in droves, which initially caused the animals to become much more agitated. However, after some time, they grew accustomed to the situation and began to behave normally, with 44% of males and 14% of females engaging in normal resting behavior. The animals mostly displayed alertness signals, and as their young began to hide under their body parts, they also exhibited breastfeeding behavior. Males exhibited maximum locomotive behaviors of up to 69% for the protection of their herd, while the proportion of males engaging in sexual behavior decreased to about 5-7% after noon due to visitor acclimation.

Discussion

Visiting Behaviour

 Hog deer are a species of ungulate family native to India and Southeast Asia. They are highly social animals, often congregate in large herds, and are known to be very wary of humans. As such, they can be greatly affected by human activity, especially when it comes to feeding behavior. It is well documented that human presence can significantly impact the feeding behavior of hog deer. When humans are present, hog deer often become much warier and avoid areas where they can be seen. This can lead to a decrease in foraging because the deer are constantly on alert for potential threats. Additionally, the presence of humans can cause the deer to become more selective in what they consume. They may choose to focus on higher quality food sources that are easier to access, such as large, nutrient-rich patches of grass, rather than smaller, less nutritious patches of grass.

This study covered two aspects i.e. visiting behavior and feeding management in hog deer. Under visiting behavior, the parameters such as resting, locomotion, feeding and drinking, and reproductive behavior in

hog deer were observed. The study lasted two months and the results were compiled weekly. The results depicted that the resting position in hog deer decreased linearly from 1st to 8th week of the study both in male and female animals, while the locomotion increased over time in both sexes. Feeding behavior was also decreased with the passage of time but the reproduction and agnostic behaviors were increased in both sexes of hog deer. The results of the study showed that the animals get used to human crowed which confirmed many previous studies on the subject as reported by of time during that hog deer.

In the present study, we saw that many animals tend to become less wary of humans when human disturbance is nonlethal often leading to changes in habitat and resource use as well as antipredator behaviour. In contrast, lethal or highly disruptive human disturbance can result in increased sensitivity or dispersal. For example, many animals increase their wariness during hunting seasons. Differences in wariness can be detected by measuring the escape behavior of wildlife. The effect of the visitor on animal behavior in captivity has been widely reported. However, whether this visitor-effect also influences stress for captive animals is still limited and absent for captive deer.

Another explanation for differences in escape behavior among parks is that human activity within parks could result in the selective dispersal of deer with different personality types. There is growing support for the existence of individual personalities, or behavioral syndromes, in many species. Bold deer may be more likely to remain in high-visitation parks than shy deer, whereas both shy and bold deer could remain in low-visitation parks. However, the juvenile deer we observed typically appeared uncertain about when to flee, looking to nearby adult deer rather than focusing on the researcher. Focal adult deer could act bolder to protect juveniles or be waiting for juveniles to move. An animal's physical situation also affect by their reaction to people. Enclosure strategy, such

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as the sort of fence between people and animals (e.g., cable net or glass), size and structures in the field to tolerate animals to approach or escape visitors, as well as the tallness and closeness of visitor observing zones, will govern the animals' physical contact to visitors. (Sherwen & Hemsworth, 2019).

Weight Gain

The data on weight gain of Hog deer in 60 day of the experiment indicated that there was a significant ($P < .05$) increase in weight addition in animals fed the prepared feed compared to the animals fed usual feed (control vs. treated groups). Similarly, there was also significant ($P < .05$) in weight gain among different treated groups. The average per animal increase in group- D was 0.490 kg compared to 0.182 kg in animals of group A (control). Per animal increase in weight gain in group-B and group-C was 0.257kg and 0.395 kg respectively. The results indicated that there was a linear increase of weight gain with the increase of prepared feed added in the diet of hog deer. The presence of humans can also disrupt the feeding behavior of hog deer by causing them to move between feeding sites more often. This can be especially problematic if the deer consume food from an area, not their primary feeding site. For example, if humans are present at a site where hog deer typically feed, the deer may move away from the site, decreasing the amount of food they consume. In addition to the direct effects of human presence on hog deer feeding behavior, there are also indirect impacts. For example, the presence of humans can lead to increased predation pressure, as predators may be attracted to areas where hog deer are present due to the presence of people. This can lead to a decrease in the amount of food available to the deer, as predators may consume some of the food sources.

The findings of current study resemble with the experiment of Staudenmaier *et al., (*2022) that reported that having little space, a high population density, little foliage, human disturbance, and additional food are all considered to be conditions of captivity in this study. The food of deer raised in captivity is significantly altered. Because deer in captivity consume native vegetation more quickly than they can regenerate, additional nutrition is required. Furthermore, captive deer do not have access to the same range of vegetation as the animals in the wild. Variations in nutrition have been found to have an impact on both the size of the antlers on male deer and overall body mass in previous studies. In captivity, low relative body mass can significantly impair mating success, which frequently results in decreased fitness.

Overall, it is clear that the presence of humans can have a significant impact on the feeding behavior of hog deer. As such, it is important for people to be aware of the potential effects of their presence on the behavior of hog deer, and to take steps to minimize these impacts. This can include staying away from known hog deer feeding sites or taking steps to limit the amount of noise and disturbance in areas where hog deer are present. By doing so, people can help ensure that hog deer have access to the food they need to survive and thrive. The impact of visitors on deer captivity can be both positive and negative. On the positive side, visitors can provide enrichment and social interaction for captive deer, which can improve their health and well-being. Visitors can also bring attention to the plight of captive deer, raising awareness and promoting conservation efforts. On the negative side, if visitors are not properly managed, they can cause stress to captive deer and increase the risk of disease transmission. Additionally, if visitors are allowed to interact too closely with the deer or feed them, this can lead to the deer losing their natural fear of humans, which can put them at risk in the wild (Gholib *et al.,* 2021).

Conclusion

This study was conducted to observe the behavior of hog deer towards visitors and feeding aspect. 20 animals of hog deer approximately of same age and weight of both sexes were included in the study. The animals were divided into four experimental groups consisting of five animals (Hog Deer) in each group. The dietry treatments groups include i.e., Group A control group no addition of formulated feed, Group B containing 0.25 kg formulated feed per animal per day, Group C containing 0.30 kg formulated feed per animal per day, Group D containing 0.40 kg formulated feed per animal per day. Overall, the study's findings showed that the linear addition of prepared feed to the diet of animals was beneficial as they showed better feed consumption and weight gain. The findings of animal behaviour towards the visitors showed that overcrowding had a negative influence on their habitat and diet. Consequently, proper dietary and management care are required to keep the population of Hog deer in healthy conditions during captivity The study's findings were consistent with the results of many previous research findings on the subject.

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