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Breeding Behaviour and Management Practices of *Struthio camelus* under Captive Condition at Private Farm Tehsil Jhando Mari

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ABSTRACT: *The study was conducted on a private farm in tehsil Jhando Mari, district Tando Allahyar, to observe the behavior of captive ostriches. Twenty birds, aged 10-150 days, were divided into groups of five, with four birds in each group ringed for identification. Observations were made for four consecutive days, six hours daily, in the morning, noon, and afternoon. Behavioral data were collected every 30 minutes, totaling 16 observations per bird per day. The study analyzed behaviors such as attacking, stone ingesting, picking, feces ingesting, running, standing, and walking. Non-parametric tests revealed significant differences in eating, lithophagia, standing, and walking behaviors during the morning and noon periods, especially in the first hour of the day. Age significantly influenced sand bathing behavior during morning and afternoon. Comparisons between noon and afternoon showed significant differences in eating, walking, dancing, running, lithophagia, sand bathing, and coprophagia, with maximum activity observed from dusk to dawn. The study concluded that ostrich behaviors vary with age and time of day under captivity.*

Keywords: *Breeding behaviour, Management practices, Ostrich, Captive condition*

INTRODUCTION

The Ostrich is the largest living bird on the earth omnivores, eat grains, and grass also some types of insects' lizard and small reptiles. Ostrich is flightless bird that has long neck with two toys with large body size with strong legs can walk more than 70 kilo meters per hour (Dikmen, 2024; Amado et al., 2011). Ostrich has high efficiency to tolerate heat, withstanding temperature rages 56°C without getting stressful conditions (Tomuta et al., 2021). Ostrich feathers have excellent insulator ability to receive solar radiation and decrease loss of heat in the winter season (Dragon et al., 2019; Souza, 2004). The African ostrich species widely known as social species therefore it mainly reared in groups (Cooper, 2001 and Cooper et al., 2009). Ensuring that animals could exhibit their natural behaviours is a fundamental aspect of promoting good welfare. Newberry and others said in

2007 that pecking is normal behaviour seen outdoors, which helps set who ranks higher within a group (Amado et al., 2011; Menon et al., 2014). Chicken groups usually have one male who looks after a group of females and takes care of the baby chicks. Using ways to manage like putting ostrich babies of the same size together can stop more food being eaten by bigger ones compared to smaller ones. This makes conditions better for these animals (Fraser and Broom, 2007). The goal of this study was to look at how ostriches behave when they are kept on farms and held captive for ten days to five months. This is an important time in their growth and ability to live through these ways used for raising them.

METHODOLOGY

This study was performed at a private farm close to Nasarapur area in taluka Jhando Mari district Tando Allahyar. During the time of study, daily temperatures

changed from 20°C in early morning to 38°C at midday. Also, humidity levels varied between highs of 78% in mornings and lows around 45% during middle afternoons. There was no rain recorded during this time. The buildings were made following African ostrich farming rules (Souza, 2004). They had a yard surrounded by fence and a main shelter in the centre. Each open space was 20 meters by 20 meters for groups of twenty birds up to five months old. When they got older, the space for each group of 30 birds grew to be 20 meters by 30 meters. In both protected and open areas, the base was made of packed earth with rocks.

Behaviour observation and parameters

Ethograms:

Courtship behaviour

Standing (S): recorded when staying in one place with head up.

Running (R): is moving on two legs off the ground next to a wall across a playground.

Walking (W):

Management behaviour

Drinking: drinking from bowl counted at one time.

Feeding: feeding of food.

Coprophagia: Involves eating poop.

The birds under observation were divided into 5 groups: (1) Age ten to forty days, (2) Age between 41 and 60 days, (3) Age ranging from sixty-one to ninety days, (4) Time period of ninety-one up to one hundred twenty years old, and (5) the final set marked in this range which is the longest with age amounts reaching as high as up to a full total. Each age group had 30 birds in it, but only four randomly selected chicks from each group were marked with different colour Velcro rings and checked every day.

Total four numbers of people watched the behaviour for four days in every age group. We did this three times a day at different hours each time. Period 1 was from 8: From 12 to 5 PM time by midnight till noon, the second

phase started then ran up to. Then came the last instalment which occurred between those two other parts from 3 in afternoon until nightfall at late evening time, and so on each different timeslot has its go during.

Data Collection

In March, we gathered data on sunny and dry days that were between 20°C to 30°C temperature-wise. The humidity was at about half of what it could be or around 52%. We used the one-zero method for recording behaviour suggested Martin and Bateson during 1986, that all birds were kept under observation for five minutes after 30 minutes, So, during a day they observed them all together for a total of 80 minutes (16 times with each one lasting only 5 minutes). Since some variables didn't have a normal distribution, we used non-parametric stats instead. For each age group, the average number of times it happened every hour was added up. We

compared how people act differently in different age groups using a special test called the Kruskal-Wallis. We used a method called Spearman rank correlation to check for connections between different factors.

RESULTS AND DISCUSSION

During the early months of life, ostriches exhibit a behavioural repertoire that is primarily focused on exploring and familiarizing themselves with various aspects of their enclosure. They also talk with other birds, which can cause them to claim areas and form families in production systems (Jayne and See, 2019; Kokoszynski, 2017). Young ostriches around 10 to 40 days old spent less time on average compared with those older now at between age of 41 and 60 days. Ostriches' ages, $z=2245$ for the ones who are over a month younger than that in group has higher trend when aged from range like below they were born after being shared out

Details are given in Table-1. The findings of our study showed that Ostrich in the age of 121 to 150 spend less time for different behaviours such as bust bath, dancing, running, aggression and drinking, feeding as compared with the age of 41 to 60 and 61 to 90 days during the daytime of period. The results of (Souza, 2004; Carrel et al., 2005), within their confines, captive birds can be seen walking, running, and eating. During the first month of life, younger birds prefer to walk and run more, whereas older birds stand still more (Dragon et al., 2019; Alvarenga, 2006), reported that this conduct is linked to frustration or a restricted environment; stress and frustration can be reduced by restoring a more natural setting. According to the study conducted by Souzo (2004), in morning dances are frequently performed by both wild ostriches and animals kept in captivity, and these behaviours occur more frequently in shelters. At six in the morning,

the birds were still in the refuge and could be seen dancing (Engelbrecht, 2013; Csermely et al., 2006). The study found low water consumption in all age groups of ostriches, possibly due to food consumption, environmental dryness, and high temperatures. Adult ostriches only used 1.1% of their time for water intake activities (Ipek et al., 2003; Mukhtar and Mirza, 2017). The study suggests that water availability is related to young ostriches learning to drink water. The low use might be because there's only a little plastic in the water tanks, they aren't protected, and no new water is put in often. The research showed that ostriches kept in places like zoos and hot temperatures mostly drink water during early morning and evening times (Mohapatra et al., 2014; Cooper et al., 2010). They eat more food first thing in the day then again around afternoon hours.

Table 1: The results for average mean frequency of different behaviours of Ostrich during different stages of age under captive condition

Behavior	Age of Ostrich birds in days				
	10- 40 days	41-60 days	61-90 days	91- 120 days	120-150 days
Dust bath	----	0.10±0.08	0.13±0.05	0.11±0.07	0.08±0.01
Coprophagia	2.88±0.1	1.03±0.14	1.04±0.07	0.88±0.12	0.75±0.08
Walking	5.33±0.21	3.47±0.17	3.39±0.31	3.27±0.43	0.97±0.07
Drinking	0.77±0.03	1.16±0.15	1.16±0.12	0.66±0.04	0.57±0.05
Standing	0.22±0.07	1.11±0.15	0.45±0.13	0.6±0.11	0.98±0.14
Dancing	0.37±0.07	----	----	-----	-----
Running	0.76±0.13	0.33±0.09	0.13±0.05	0.11±0.05	0.10±0.01
Aggression	0.87±0.21	0.001±0.001	0.001±0.01	0.02±0.01	0.01±0.01
Lithophagia	0.01±0.01	2.41±0.57	2.31±0.15	2.59±0.06	2.11±0.21
Feeding	3.21±0.11	2.45±0.33	2.87±0.17	2.76±0.23	0.67±0.07
Pecking	0.00±0.01	0.21±0.09	0.56±0.02	1.17±0.27	0.55±0.11

However, higher temperatures from 11:30:00 pm to 6:01 am might have caused a reduction in eating food so as not to gain more calories. The study's results got mixed up because of temperature and food offer, which makes it hard to tell what caused them. Details given in Table 2. Sauer and Sauer (1966) found that ostriches in nature spend most of their time walking, eating

grass or searching for food to get the nutrients they need every day. The study found that ostriches exhibit calm behaviour near noon, spending more time standing. This behaviour is consistent with previous research (Csermely et al., 2007; Brasso et al., 2020) findings. The study also found greater expression of this behaviour in captive male ostriches. The result regarding

dust bathing suggested that a common ostrich behaviour was observed more frequently in late afternoons in Great Britain, but it wasn't very

visible in the morning and got higher during afternoon. It was most noticeable at sunset time Croney et al. (2007).

Table 2: The results for average mean values of Ostrich during different stages of daytime under captive condition during the daytime

Behaviour	The time calculated during day period		
	8 AM to 11 AM	11 AM to 2 PM	2 PM to 5 PM
Dust bath	0.01±0.01	0.01±0.01	0.28±0.3
Coprohagia	2.01±0.19	0.98±0.22	1.76±0.34
Walking	3.11±0.07	3.014±0.09	3.51±0.11
Drinking	0.98±0.13	0.57±0.03	1.13±0.07
Standing	0.91±0.11	0.47±0.03	0.85±0.09
Dancing	0.24±0.14	0.28±0.03	0.49±0.11
Running	0.26±0.07	0.19±0.01	0.46±0.02
Lithophagia	3.01±0.37	1.76±0.71	2.41±0.37
Feeding	2.98±0.21	2.00±0.11	3.23±0.07

CONCLUSION

The study revealed that ostrich behaviour changed with age and even throughout the day. However, defining normal behaviour is challenging and further research is essential to understand ostrich needs under various production conditions.

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Not Applicable.

CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

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