

SOME BEHAVIORAL TRAITS OF RED NECK OSTRICH UNDER CAPTIVE CONDITIONS

F.A. MOHAMMED AHMED^{1*}, R.R. MOHAMMED SALIH²

¹Department of Fisheries and Wildlife Science College of Animal Production Science and Technology, Sudan University of Science and Technology P.O.BOX204, Khartoum North, Sudan

²Department of Clinical Medicine College of Veterinary Medicine University of Khartoum P.O. Box 32, Khartoum North, Sudan

*Email: fawziali38@yahoo.com

ABSTRACT: The present study has been conducted to observe some behavioral traits of ostrich under captive conditions. The observations have been carried during the period 14 June to 24 June, 2005, for 8 equal time period, extending for 24 hours from 0600 p.m hour to 0600 p.m hour next day. The bird flock consisted of two adult males and adult female, kept in the Collage farm, in a cage joined to a fence to allow for free movement. The recorded behavioral activities included: standing in the sun, standing in shade, laying in the shade, laying in the sun, staying in the cage, movement and sitting on the knees, feeding, drinking, quarrel, urination, defecation, ritual display, courtship, and preening. It was noticed that the most time consuming activities were standing in the sun, standing in the shade, laying in the shade, and movement. The longest period of the time budget was taken in laying in shade (250.3 min.). The shortest fraction of the time budget was spent in courtship maneuvers (3.25 min.). The main target of the study was to provide ostrich breeders with useful information for better management.

Key words: Behaviour, Ostrich, Captivity Condition, Birds

INTRODUCTION

Ostrich (*Struthio camelus camelus*) is the largest and heaviest living bird and is the only bird with just two toes and sole representatives of the order Struthioniformes (Alden et al., 1996). Ostriches produce red meat that is very similar in taste and texture to veal and beef (Du Preez, 1991; Anonymous, 1994). The meat has been reported to be of high protein, and low cholesterol than any other protein of animal origin (Shanawany, 1996). With increasing incidences of human's heart associated problems in developing countries such as Sudan, ostrich farming would be of importance not only in supplementing protein requirements of the growing population in the country, but also in providing abundant and cheaper supply of meat for people with specific nutritional requirements such as low cholesterol and low fat. Studies on behaviour are important for evaluation of the welfare of animals. Ostriches have not been selectively bred with the objective of minimizing the effect of the stress experienced on farms.

The African ostrich is a social species; therefore it thrives better in groups (Bolwig, 1973). Thus, providing conditions where the animals can express their normal behaviours is one of the basic requirements of good welfare. According to Newberry et al. (2007), in the wild, pecking is a natural behaviour that leads to the establishment of a pecking order in the group. Mitchell (1960) (quoted by Bertram, 1992) published a list of 300 citations dealing with this species, but most of them were devoted to physiology, veterinary aspects, husbandry and marketing, while not involving behavior this was described in detail only in recent decades, firstly by Sauer and Sauer (1966) and Bertram (1992). Even less attention has been paid to a detailed quantitative description of behaviours or behavioural patterns displayed by captive ostriches. In fact, most authors either considered gross daily temporal budgets for a few behaviours (Degen et al., 1989) or made more detailed behaviour descriptions in various contexts, but still in terms of just percentage of time (McKeegan and Deeming, 1997; Deeming, 1997, 1998). As far as this study concern of, there are no studies devoted to the analysis of behaviour in terms of the sequences of behaviour forming the whole behaviour repertoire. Recent increases in ostrich breeding, principally in South Africa and later in Israel and Europe, led to the necessity to learn more about its behaviour in restricted areas.

The study of behaviour transitions helps understanding the sequences of behaviour. It is believed that analysis allows understanding the relationships among different behaviours and their relative importance more deeply than simply ascertaining the duration of each behavior, considered separately from the others (Cronin, 1985; Csermely, 1994).

ORIGINAL ARTICLE



The objective of the research work was to study some behavioral traits of Red Neck Ostrich under captive conditions.

MATERIALS AND METHODS

This study was carried out at the farm of College of Veterinary Medicine and Animal Production Sudan University of Science and Technology. Three individuals of Red neck 4-years old ostriches (*S. c.camelcus*) two male and one female were included in the study. They had been living in unit for at least 3 years.

The part of unit used for the study consisted of two rows of three identical outdoor paddocks, separated by an inspection corridor 4 meter wide. The paddocks were 60 m \times 41 m (1504 m²) in size and delimited by 4 m high wire mesh. Each paddock had a wooden shelter of about 8 m² (three sides and roof), and contained a trough located at the middle of the paddock's short side in front of the inspection corridor and a plastic water container (80 cm \times 40 cm \times 45 cm) on the ground just outside the shelter.

Two to five small trees (4–5 m high) were scattered in each paddock. The ground was natural, but the grass had been removed by ostrich locomotion and the ground became muddy after rains. Behavioral activities which were observed and recorded included: standing in the sun, standing in shade, laying in the shade, laying in the sun, staying in the cage, movement and sitting on the knees, feeding, drinking, quarrel, urination, defecation, ritual display, courtship, and preening. Simple statistical analysis was performed with the mean and standard deviation (Steel and Torrie, 1980).

RESULTS

As shown in Figure 1, 2 and 3. The total observation duration for the three individual as a whole was 240 hours. Males and females were recorded equally. Both sexes were mostly involved in similar activities. Closed-wing Walking and Environment Pecking. These behaviors took up 39.0% and 41.1% of time in males, respectively, and 40.4% and 43.1% in females, respectively. Walking, as a whole, plus running, as a whole, involved almost one half of observation time in both sexes (13.2%). Birds also spent 11.9% of time in standing in the sun, 1.6% in eating and 0.5% in raised-head resting. On the other hand, ostrich were involved for 25.9% of time in standing in the shade, 28.8% of time in laying in the shade and 5.3% of time in staying in the cage.

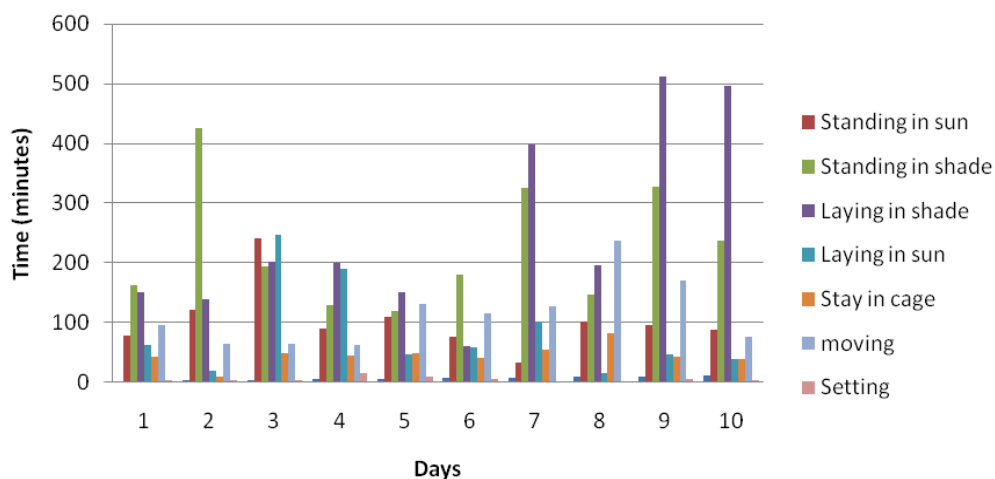


Figure 1 - The duration in minutes of some behaviors displayed by ostriches in 24 hours for 10 days

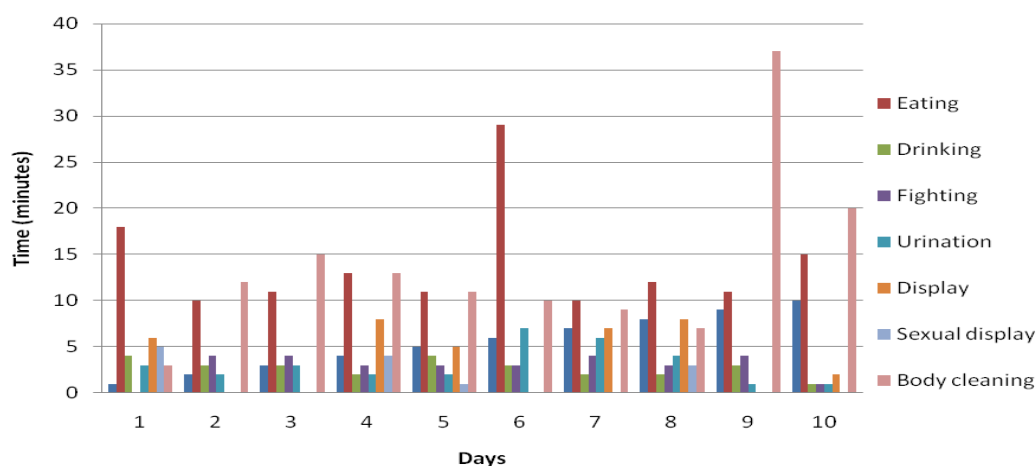


Figure 2 - The duration in minutes of the behaviors displayed by ostriches in 24 hours for 10 days



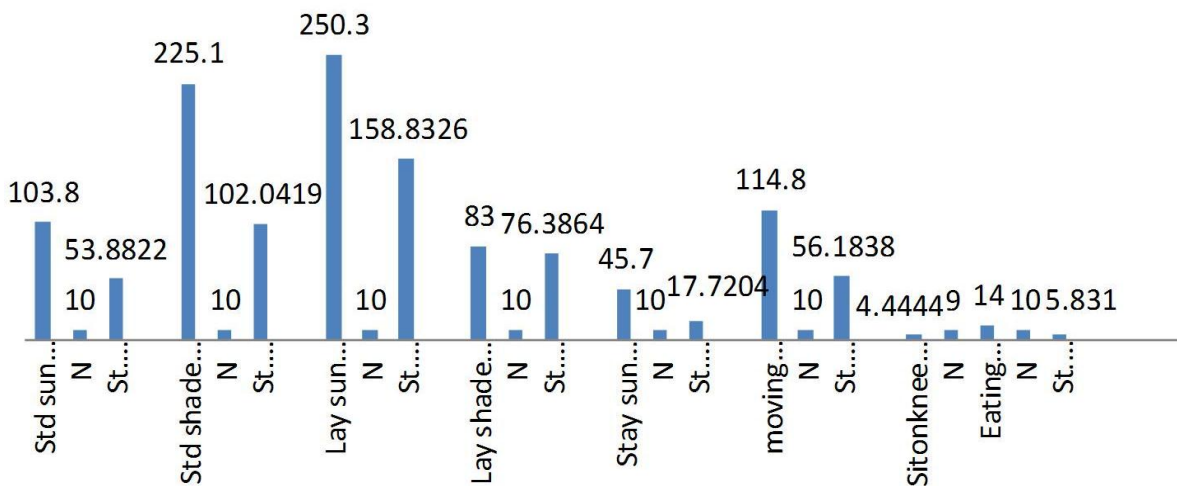


Figure 3 - The high frequency behaviors recorded among various ostrich. (Std: Standing, St: Standard, N: Normality)

DISCUSSION

The proportion in the time-activity budgets displayed by the male and female ostriches are largely comparable with data recorded by others in both Europe (Sambraus, 1994; Milton and Dean, 1995; Ross and Deeming, 1998) and South Africa (Lambrechts et al., 1998). This primarily concerns walking in general, comprising the several variations considered, but also other important behaviours such as standing and eating, the present study showed the same behaviour types dominating the activity budgets recorded by other authors. There are some discrepancies in the values, probably due to the different recording methodology used to record of the behaviour. Although sexual differences were beyond the aims of this work, marked sexual differences in percentage time-activity budgets do not seem to exist, as instead reported by McKeegan and Deeming (1997) and Lambrechts et al. (1998), but this might be due to the longitudinal nature of the present study, which could increase overall similarity of activity in both sexes. The great majority of the recorded behavioural transitions were one-way transitions in both sexes and age.

The time-activity budgets showed fact that there was some sort of variability among the behaviours. Some of them, e.g. walking and pecking the environment, have great incidence in the repertoire of wild ostriches as well. The ostriches stood still more in the morning than in the middle of the day. The birds also walked less in the middle of the day. They ran and drank more in the afternoon than at noon. The lowest frequency of eating and lithophagia were found at noon. Coprophagia and dancing were less observed in the middle of the day than in the afternoon. Dust-bath was observed mostly in the afternoon. High temperatures of approximately 35°C from 11:00 to 3:00 p.m. during experimental period may have caused a reduction in bird activity during this period. The birds were observed drinking water and feeding with lower frequency in the middle of the day than to the other periods.

Both drinking and feeding were different to period 3. According to Souza (2004), ostriches in captivity and in hot weather conditions drink water at dawn and at dusk. During the trial period, there was a higher consumption of feed in the early hours of the day and during the afternoon, which coincides with the hours of lower environmental temperature, as well as the time when food is distributed. Nevertheless, higher temperatures from 11:00 a.m. to 3:00 p.m. may have led to a decrease in the food consumption to avoid caloric enhancement resulting from the digestion process. Sambraus (1994) and Deeming (1998) also found higher consumption of food during the morning when the food was supplied also McKeegan and Deeming (1997), who observed pairs of adult ostriches in captivity, reported a peak in the consumption of feed in the morning for both sexes.

In the present study, temperature and food offered were confounded, therefore it was not possible to separate their effects. On the other hand, it is reported by Sauer and Sauer (1966) that ostriches in natural environment spend most of the time walking and feeding during the day, including grazing and seeking other kinds of food. This probably relates exploratory behaviour with the aim of achieving the daily nutritional requirements. In this study, the ostriches at the hours close to noon, showed a calm behaviour. They spent more time standing in the early hours of the day. Deeming (1998) found no diurnal variation in the frequency of this behaviour during the winter in captive ostriches. Similar results were found by Ross and Deeming (1998), who studied the behaviour of ostriches during the summer. In this study, the birds were moving more in the early hours of the day and at the end of the afternoon, which is in accordance with the results found by McKeegan and Deeming (1997), who reported greater expression of this behaviour in the morning and afternoon in captive male ostriches.

REFERENCES

Alden PC, Estes RD, Schlitter D and McBride B (1996). African Birds, In: Collins Guide to African Wild Harper Collins publishers, London, pp: 638-63.



- Anonymous (1994). Ostriches product exports, Farmers weekly acacia publishers Nairobi Kenya, pp: 24.
- Bertram BCM (1992). The Ostrich Communal Nesting System. Princeton University Press, Princeton.
- Bolwig N (1973). Agonistic and sexual behaviour of the African ostrich (*Struthio camelus*). The Condor, pp. 100-105.
- Cronin GM (1985). The development and significance of abnormal stereotyped behaviours in tethered sows. Ph.D.
- Csermely D (1994). Maternal behaviour of free-ranging sows during the first 8 days after farrowing. J. Ethol. 12, 53-62.
- Deeming DC (1998). A note on effects of gender and time of day on the winter time-activity budget of adult ostriches (*Struthio camelus*) in a farming environment. Applied Animal Behaviour Science, pp: 363-371.
- Degen AA, Kam M and Rosenstrauch A (1989). Time-activity budget of Ostriches (*Struthio camelus*) offered concentrated feed and maintained in outdoor pens. Appl. Anim. Behav. Sci. 22, 347-358.
- Du Preez JJ (1991). Ostrich nutrition and management. Recent Advances in Animal Nutrition in Australia. Armidale: University of New England.
- Lamrechts H, Cloete SWP and Davies HJ (1998). Influence of L- carnitine-magnesium supplement on the behaviour of Librarianship, Cape Town. Life. Harper Collins publishers London. pp: 638-63.
- McKeegan DEF and Deeming DC (1997). Effects of gender and group size on the time-activity budgets of adult breeding ostriches (*Struthio camelus*) in a farming environment. Applied Animal Behaviour Science, 159-177.
- Milton S and Dean R (1995). Gizzard stones and food selection by free-range ostrich: implication for management. East Coast Producers Assoc. January/February, 4-7.
- Mitchell EK (1960). The Ostrich and Ostrich Farming. Bibliographical Series of the University of Cape Town School of metabolism, water requirements, and foraging behaviour of wild ostriches in the Namib. Ecology, 74: 390-404.
- Newberry RC, Keeling LJ and Estevez I (2007). Behaviour when young as a predictor of severe feather pecking in adult laying hens: the redirected foraging hypothesis revisited. Applied Animal Behaviour Science, 262-274.
- Sambras HH (1994a). The circadian rhythm in the behaviour of ostriches (*Struthio camelus*) kept in pens. Deutsche Tierärztliche Wochenschrift, pp. 339-341.
- Sauer EGF and Sauer EM (1966). The behaviour and ecology of the South African ostrich. Living Bird, Supplement 5: 45-75.
- Shanaway MM (1996). Emergency of ostrich meat. Meat int., 6: 10-13.
- Souza JS, Criação de avestruz Viçosa, MG and Aprenda Fácil (2004). 211 p.logy of the South African ostrich. Living Bird, Supplement 5: 45-75. Thesis, University of Wageningen.
- Steel RGD and Torrie JH (1980). Principles and procedures of Statistics. McGraw-Hill Book Co.Inc. New York.