

## Grazing Behaviour of the Swamp Buffalo (*Bubalus bubalis*)

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**Key words:** Swamp buffalo; grazing behaviour; thermoregulation

### RINGKASAN

*Satu penyelidikan tentang tabiat kerbau telah dijalankan di ladang Universiti Pertanian Malaysia, Puchong. Keputusannya menunjukkan yang ragutan (memakan rumput) dilakukan sepanjang hari dimana kebanyakannya pada waktu siang. Sebagai satu cara untuk mengimbangkan suhu badan kerbau-kerbau ini suka berkubang diwaktu siang dan malam dan ini adalah penting untuk kesehatan dan produksi. Diwaktu malam kerbau-kerbau ini samada berbaring atau berdiri dan kadangkala berjalan. Ruminasi berlaku semasa kerbau-kerbau ini berkubang dan berbaring.*

### SUMMARY

*Studies on the grazing behaviour of the swamp buffaloes were carried out in the Universiti Pertanian Malaysia farm at Puchong. The results have shown that grazing took place throughout the whole 24-hour period with the greater part during the day. As a means of thermoregulation the animals wallowed in a pool of water during the day and night; this was important in controlling body temperature and for the animals' well-being and hence their productivity. During the night the animals were either lying down or standing; there was with very little walking. Rumination took place while the animals were wallowing or lying down.*

### INTRODUCTION

The behaviour of an animal is controlled by many factors. Among the most important are nutrition and physiological thermoregulation. The regulation of feed intake to provide for maintenance and productive requirement is also greatly influenced by the regulation of body temperature which is related to the optimal thermal conditions for biochemical processes.

In the hot humid environment of Malaysia, the behaviour of the animals greatly narrows the range of heat loads from that of autonomic thermoregulation. When buffaloes are allowed to graze in an open field they exhibit behavioural changes adaptable to the environment. This knowledge enables us to understand and provide the necessary requirements for the buffaloes to achieve optimal production. This study was conducted to determine the behaviour of buffaloes in the open field by recording the various activities exhibited by buffaloes during a defined time period.

### MATERIALS AND METHODS

Four female and three male two-year old water buffaloes were allowed to graze freely in

an eleven-acre pasture in the UPM farm at Puchong. The grazing area selected enclosed a pool of water so that the animals could have access to wallowing. A water tank was also placed inside the paddock to provide drinking water.

Observation of the behaviour of the buffaloes in the paddock was done from a tower placed on high ground at one corner of the paddock. The animals were observed for twenty-four hours for two days with the aid of a pair of binoculars. White markers on the body and the horn were used to identify the buffaloes. Day was defined from 8.00 a.m. to 8.00 p.m. and night was from 8.00 p.m. to 8.00 a.m.

Observation during the day was simple but some difficulties were encountered during the night. Night observations of the various activities were done by intermittently illuminating the animals with torchlight. Precautions were taken to ensure minimum disturbance of the animals.

Five main activities of the animals were observed and recorded. These were grazing, wallowing, walking, standing and lying down.

RESULTS AND DISCUSSION

The buffaloes were seen to move in a group and this influenced the behaviour of an individual animal. There were also differences in male and female behaviour as shown in Table 1. The behaviour of the buffaloes was observed and recorded as day and night activities. The main day activities were grazing and wallowing and the main night activities were standing, lying down, grazing with intermittent wallowing and walking, as shown in Fig. 1. Hafez *et al.*, (1969) suggested that, in tropical climates, night grazing may occur more frequently among cattle during the more comfortable periods when the temperature was lower. But this was not the case with our buffaloes which grazed more during the day, mostly in the evening. Their grazing behaviour was complemented by wallowing which helps to cool the body temperature brought about by body metabolism and solar heat. In our study the animals were observed to start grazing early in the morning, and by 10.00 a.m., wallowing had begun and continued, with intermittent grazing, till 8.00 p.m. (Fig. 1). This seems to be a result of increasing ambient temperature which has been shown to increase the body temperature and respiration rates (Badreldin and Ghany, 1952; Kassim *et al.* 1977). The highest recorded temperature at noon was 32°C. Swamp buffaloes apparently need to wallow in a pool of water or mud to cool themselves. This form of behavioural thermoregulation (Baldwin, 1973) is an adaptive process to accelerate heat loss since buffaloes are unable to dissipate excess body heat through sweating (Hafez and Shafei, 1954; Hafez *et al.* 1955). The natural wallowing probably was very effective in reducing body

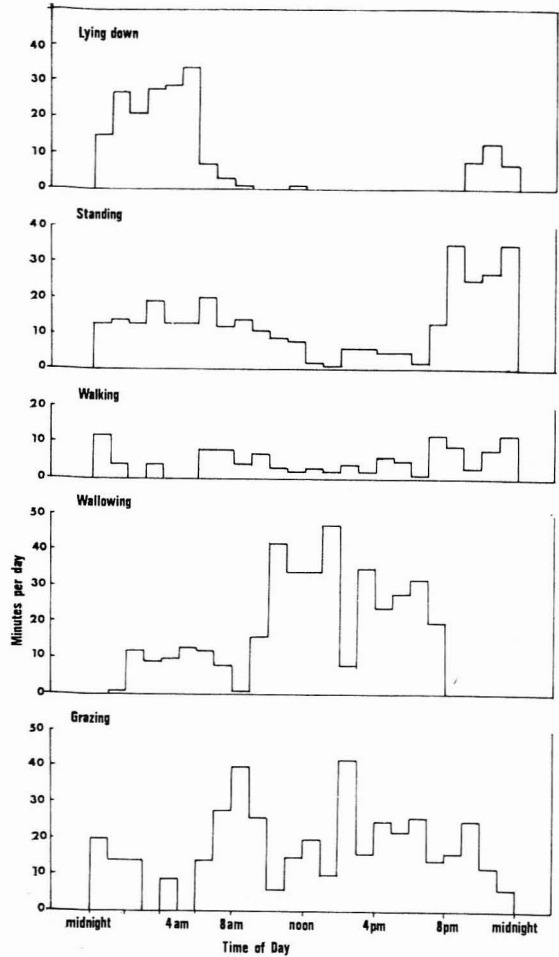


Fig. 1: Main diurnal activities of the Swamp buffaloes.

TABLE 1

Mean time spent for the day and night in each of the five activities

Animal Type		Time spent (hours)				
		Grazing	Standing	Walking	Wallowing	Lying down
Males (n = 3)	Day	5.00	1.63	0.90	4.47	0.02
	Night	2.25	4.87	1.45	2.45	0.97
	Total	7.25 (30.2%)	6.50 (27%)	2.35 (9.8%)	6.92 (28.8%)	0.99 (4.2%)
Females (n = 4)	Day	3.87	1.32	0.86	5.90	0.05
	Night	2.90	3.28	0.93	0.03	4.85
	Total	6.77 (28.3%)	4.60 (19.2%)	1.79 (7.5%)	5.93 (24.6%)	4.90 (20.4%)

temperature as was pointed out by Kassim *et al.* (1977) who showed that even by artificially cooling the animals with water the body temperature and respiration rate were maintained at normal (low) level. Wallowing at noon, therefore, would remove excess body heat through the water and mud of the wallowing pool. Ruminating was observed to take place while the animals were wallowing. However, it was observed that at 2.00 p.m. the animals started to graze again and wallowed intermittently.

In the evening, after 8.00 p.m., the animals tended to stand. There was little walking and grazing at night. After midnight the animals were observed to lie down and spend some time wallowing. The cool of the morning created a wider temperature gradient between the animal and the environment. This would have increased the convective heat transfer from the respiratory system and the skin. If there were winds or draughts then more heat transfer (loss) would take place. Lying down or wallowing would probably reduce this heat loss because of the smaller total exposed surface area and less heat lost through conduction with the ground and water.

There were behavioural differences between the males and females. The most prominent was that the females spent more time lying down and less time wallowing at night. When the females were lying down the males tended to stand and walk around as if guarding the females.

These observations suggest that the buffaloes were experiencing a degree of heat stress and wallowed in order to cool themselves. The

animals grazed early in the morning and in the evening. For the well being of these animals it is suggested that a wallowing area is essential; and if this were not available then a shed should be built in the grazing area for the animals to protect themselves against heat stress.

#### ACKNOWLEDGEMENTS

We are grateful to Drs. S. Sivaraj, R. Karupayah, S. Santhana Das, N. Devi, V. Panicker, N. Sewellenggam and Shamsul Kamal for their assistance during the study.

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(Received 28 June 1979)