

Short Communication

Time Budgets in Red Junglefowl as a Baseline for the Assessment of Welfare in Domestic Fowl

MARIAN STAMP DAWKINS

Animal Behaviour Research Group, Department of Zoology, South Parks Road, Oxford OX1 3PS (Gt. Britain)

(Accepted for publication 5 April 1989)

ABSTRACT

Dawkins, M.S., 1989. Time budgets in Red Junglefowl as a baseline for the assessment of welfare in domestic fowl. *Appl. Anim. Behav. Sci.*, 24: 77-80.

A study of the way in which semi-wild junglefowl allocate their time between different activities showed that in 60% of all minutes during the active part of the day, hens were seen to be ground pecking and in 34%, ground scratching. The fact that such a high proportion of time was spent in foraging activities is discussed in relation to the welfare of domestic fowl unable to perform such activities.

INTRODUCTION

Concern over the welfare of laying hens, particularly those kept in intensive systems such as battery cages, has led to the suggestion that the "natural" behaviour of the species should be used to assess the welfare of intensively kept birds (Thorpe, 1965; Farm Animal Welfare Council, 1986). However, not all departures of captive or domestic animals from the behaviour of their wild ancestors constitute a welfare problem and independent evidence is needed that such departures cause suffering (Hughes, 1980; Dawkins, 1988). For example, high motivation to perform prevented behaviour can be measured by seeing how much of a "cost" an animal is willing to pay to obtain access to or to avoid being in contact with something (Rushen, 1986; Dawkins, 1988).

In order to ask sensible questions about the extent to which hens in battery cages suffer through being deprived of the opportunity to perform certain behaviour patterns, we need a baseline against which to compare behaviour in intensive systems.

Domestic chickens are descended from the Red Junglefowl (*Gallus gallus* L.) which still occurs extensively in south and eastern Asia (Johnsgard, 1986). Chickens and Red Junglefowl are the same species and the behaviour of the

junglefowl can therefore be regarded as the "natural" behaviour of the species (Thorpe, 1965). The behaviour of junglefowl and domestic fowl is very similar (Kruijt, 1964) and, more significantly, the behaviour of domestic fowl that have been allowed to become feral also shows very striking similarities to that of junglefowl (McBride et al., 1969; Duncan et al., 1978). However, wild Red Junglefowl are very wary and difficult to study and, although qualitative descriptions of daily routines exist (Johnson, 1963; Collias and Collias, 1967), there is no quantitative study of the way in which junglefowl allocate their time between their different activities in nature.

MATERIALS AND METHODS

Whipsnade Park Zoo in Bedfordshire, England, provided a unique compromise: an environment very similar to places where junglefowl are found naturally with a population habituated to human presence.

An initial colour-ringed population of 20 (9 males and 11 females) first year, captive-bred Red Junglefowl were released into a large wooded area of tall trees, low bushes (mainly rhododendron) and clearings. The area (~1.6 ha) was fenced off from the main zoo without public access. The birds were fed three times a day, but were otherwise left alone. After 1 year, the population had risen to 55–60 birds.

Observations on a focal hen (different for each record) were made for a 20-min period during each hour of the "active" part of the day (defined as the period between the hens' descent from the roost in the morning to their final going to roost in the evening). For each of the 20 min, the occurrence or non-occurrence of 39 different behaviour patterns was recorded, giving a composite index of the "amount" of each behaviour (Martin and Bateson, 1986, p. 62). If a hen was not visible for the full 20 min, the actual number of minutes was taken into account when calculating the results. Observations were made at different times of the year over a 2-year-period (April 1986–March 1988) and a total of 202 hen hours was recorded.

RESULTS

The occurrence of the seven commonest behaviour patterns is shown in Fig. 1. In 60.6% of all minutes of observation (during the active time of day), the hens were seen to be ground pecking and in 34.1% they were observed to be ground scratching. Two behaviour patterns showed changes with day-length: daytime roosting was positively related to day-length (regression coefficient = +2.18; $F=5.2$; $P<0.05$) and looking (vigilance) was negatively related (regression coefficient = -2.40; $F=5.94$; $P<0.05$).

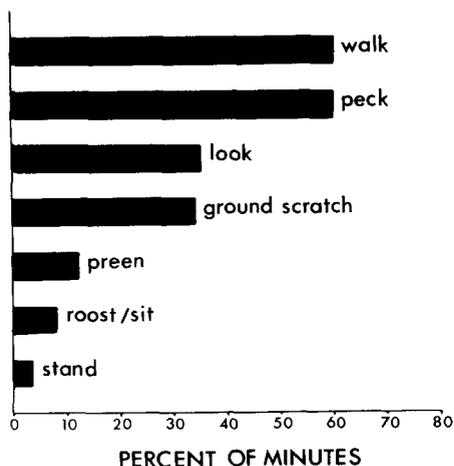


Fig. 1. Time allocation in junglefowl hens for their seven commonest behaviour patterns. The histograms represent the percentage of minutes when hens were in view in which a given behaviour was recorded. The data are for all hens for all times of year.

DISCUSSION

At all times of year, the main part of a junglefowl hen's day is given over to behaviour associated with foraging for food – pecking the ground and scratching in leaf litter. Although the birds were fed regularly, they still chose to spend their time on “foraging” activities (c.f. Duncan and Hughes, 1972; Inglis and Ferguson, 1986). In the wild, junglefowl were similarly observed to spend much of their day in this way (Johnson, 1963; Collias and Collias, 1967; M. Dawkins and N. Hillgarth, personal observation in Western Thailand), as were feral domestic fowl (Savory et al., 1978).

This may have important welfare implications for domestic fowl. Flocks of hens that have the opportunity to scratch and peck show less cannibalism and feather pecking than flocks that do not (Blokhuis, 1986). The present study suggests that the extent to which pecking and ground scratching are important to the hens themselves should now be investigated by seeing whether hens will pay a cost for the opportunity to perform them (Dawkins, 1988).

ACKNOWLEDGEMENTS

I thank Alan Woodington, Georgia Mason, Clive Richardson and Nigella Hillgarth for help with observations, and the Zoological Society of London for their provision of birds and facilities at Whippsnade. I also thank the Universities Federation for Animal Welfare for financial assistance.

REFERENCES

- Blokhuis, H.J., 1986. Feather-pecking in poultry: its relation with ground-pecking. *Appl. Anim. Behav. Sci.*, 16: 63-68.
- Collias, N.E. and Collias, E.C., 1967. A field study of the Red Jungle Fowl in North-Central India. *Condor*, 69: 360-386.
- Dawkins, M.S., 1988. Behavioural deprivation: a central problem in animal welfare. *Appl. Anim. Behav. Sci.*, 20: 209-225.
- Farm Animal Welfare Council, 1986. *Egg Production Systems: An Assessment*. F.A.W.C., Tolworth, U.K.
- Duncan, I.J.H. and Hughes, B.O., 1972. Free and operant feeding domestic fowls. *Anim. Behav.*, 20: 775-777.
- Duncan, I.J.H., Savory, C.J. and Wood-Gush, D.G.M., 1978. Observations on the reproductive behaviour of domestic fowl in the wild. *Appl. Anim. Ethol.*, 4: 29-41.
- Hughes, B.O., 1980. The assessment of behavioural needs. In: R. Moss (Editor) *The Laying Hen and its Environment*. Martinus Nijhoff, The Hague, pp. 149-166.
- Johnsgard, P.A., 1986. *The Pheasants of the World*. Oxford University Press, Oxford, pp. 300.
- Inglis, I.R. and Ferguson, N.J.K., 1986. Starlings search for food rather than eat freely available, identical food. *Anim. Behav.*, 34: 614-617.
- Johnson, R.A., 1963. Habitat preference and behavior of breeding junglefowl in central Western Thailand. *Wilson Bull.*, 75: 270-272.
- Kruijt, J.P., 1964. Ontogeny of social behaviour in Burmese Red Junglefowl (*Gallus gallus spadiceus* Bonnaterre). *Behaviour*, Suppl. 12, pp. 1-201.
- Martin, P. and Bateson, P.P.G., 1986. *Measuring Behaviour*. Cambridge University Press, Cambridge, pp. 200.
- McBride, G., Parer, J.P. and Foenander, F., 1969. The social organisation and behaviour of the feral domestic fowl. *Anim. Behav. Monogr.*, 2: 127-181.
- Rushen, J., 1986. The validity of behavioural measures of aversion: a review. *Appl. Anim. Behav. Sci.*, 16: 309-323.
- Savory, C.J., Wood-Gush, D.G.M. and Duncan, I.J.H., 1978. Feeding behaviour in a population of domestic fowls in the wild. *Appl. Anim. Ethol.*, 4: 13-27.
- Thorpe, W.H., 1965. The assessment of pain and distress in animals. In: F.W.R. Brambell (Chairman), *Report of the Technical Committee to Enquire into the Welfare of Animals kept under Intensive Livestock Husbandry Systems: Cmnd 2836*. HMSO, London, pp. 71-79.