Letter to the Editor:

Is Cortisol a Good Measure of an Animal’s Response to Cage Size?

In a recent study, Crockett et al. (1993) concluded that cage sizes (20-140% of U.S. regulation floor area) and housing level have no effect on stress in macaques, as measured by cortisol excretion, even when the cage sizes were 'unrealistically small'. In view of this statement, it is important to ask whether cortisol levels provide a good measure of animal welfare regarding living space.

Titres of cortisol, or corticosterone in rodents, are often proposed as a measure of stress (e.g. Barnett & Hemsworth 1990, Manser 1992) but the link between hormone and stress is not always firm (Breazile 1987) and it is important to realize that the hormonal response is specific to the type of stressor. In humans, increased cortisol secretion is typically seen following bereavement and in clinically depressed patients. Animals studies suggest that a wide variety of stimuli such as social conflict (e.g. Koolhaas 1983, electric shock (Weiss 1972), exposure to a novel environment (e.g. Mormede 1990), or mother/infant separation (Hennesey et al 1979) can activate the hypothalamic-pituitary-adrenocortical axis. However, it is not clear that restricted living space is a stimulus that can be grouped with the above examples. The metabolic role of cortisol is to promote catabolism (reviewed by Mason & Mendl 1993) and it seems that the adrenal cortex is most likely to be activated in situations where physical activity is appropriate. Indeed, there are a number of situations in which despite an apparently sub-optimal environment corticosteroid levels are not elevated, e.g. during water deprivation in chicks (Freeman et al. 1983), and sheep (Broom & Johnson in press) and even while the animal is in a state of pain (Rushen 1986, Bateson 1991).

Many authors (e.g. Broom 1988) have pointed to the value of studies looking at multiple variables which should be presented in an integrated fashion to give an overall picture. But it is also important to select appropriate study designs and suitable variables. Such measures might include decreased immunocompetence (see Martin 1991), gastric lesions (e.g. Moody et al. 1978) and atherosclerosis (e.g. Henry et al. 1971). It is probable that both these measures and behavioral signs such as stereotyphies, apathy, coprophagia and other abnormal behaviors (Mason 1991, Morris 1984) will take longer to develop than the two weeks studied by Crockett et al. (1992).

Crockett et al.'s study is valuable in showing the lack of cortisol response of macaques to cage space in the short term. However, studies involving appropriate measures, and with a duration closer to that in which the animals would be caged, should be carried out before drawing any conclusion regarding the long term suitability of the housing. Thus, if the proposed duration of caging is of the order of years, it is surely sensible to examine the response over a period of several months, at least.

There are strong financial reasons for housing animals in small enclosures. It is important to collect data on animals' responses to these cages, but the risk is that some people will use data, that may not tell the whole story, to endorse restrictive housing. We need studies that look at appropriate variables over reasonable time spans.

-- R. Hubrecht & G. Mason --
From the Editor’s Desk

1994 ASP Directory was mailed out in October. Correction: Reinhold Hutz (414) 229-6880. Send other corrections, change of address and membership inquiries to Jeff French, Psychology Dept, University of Nebraska at Omaha, Omaha, NE 68182-0134, E-mail: jfrench@unomaha.edu, FAX: (402) 554-3296.

Letters to the Editor - Those interested in obtaining references to the following Letters to the Editor please contact the authors. Dr. R. Hubrecht, Universities Federation for Animal Welfare, 8 Hamilton Close, South Mimms, Potters Bar, Herts EN6 3QD, U.K. Phone: 0707 658202, FAX: 0707 649279. Dr. G. Mason, Subdepartment of Animal Behaviour, Madingley, Cambridge, CB3 8AA. Dr. Carolyn Crockett and Dr. Douglas M. Bowden, University of Washington, SJ-50, Seattle, WA 98195. -- Margaret R. Clarke --

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