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Evaluating stress and distress in rats

Identifying measures for the evaluation of distress in animals that are used in biomedical research is critical for maintaining adequate animal welfare. Acute stress in animals is commonly measured via corticosterone, but serum corticosterone concentrations are influenced by multiple factors, making their association with chronic stress difficult to determine. Because exposure to chronic stressors results in a shift in white blood cell populations, the neutrophil-lymphocyte ratio has been proposed as a potential indicator of chronic stress. It has also been proposed for use in the measurement of acute stress, but because the immune-cell shift occurs hours after stress exposure, this use seems contraindicated. Swan & Hickman measured serum corticosterone concentrations and neutrophil-lymphocyte ratios after exposure to an acute stressor or to a chronic stressor, and evaluated the association between these measures and concurrent behavioral indicators of negative welfare, to determine the usefulness of each measure for evaluating acute stress, chronic stress and distress in rats.

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Responding to a large-scale rodent disease outbreak

A major challenge faced by research facilities is how to respond to an outbreak of disease in a rodent population. Such an outbreak can affect research by rendering results from studies using infected animals unreliable, impeding research groups in their efforts to collaborate with peers from other institutions, threatening the credibility and reputation of the institution and sometimes leading to loss of animal lives. In 2008, the University of Colorado Denver's Anschutz Medical Campus, located in Aurora, CO, was faced with such a challenge. After >90% of the animal colonies housed in one vivarium tested positive for multiple infectious agents, the Office of Laboratory Animal Resources planned and executed a shutdown and a decontamination of the facility, which involved the rederivation or cryopreservation of >400 unique genetically modified mouse lines. Leszczynski *et al.* detail this process and discuss the lessons learned from the project.

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