

CONTRASTS AND COMPARISONS OF INCENTIVE SITUATIONS IN DOMESTIC POULTRY

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Understanding the way in which animals perceive important features of their environment, and how this information may be stored and used, underpins the study of the impact of husbandry systems on animal welfare. Research into incentive contrast in laboratory animals has indicated that they can store and use information about stimuli associated with situations or resources. If cognitive processes are used, the relevant stimuli associated with a resource or event are encoded, allowing comparisons to be made when the key stimuli are changed. The presence and quality of this comparison, negative or positive, can be ascertained by assessing the change in the animal's level of appetitive or operant responding in order to gain access to the situation on the subsequent trial. We wished to determine whether the presence of a sudden change in appetitive response, such as speed of approach to an area following a change in incentive features of a resource or event in that area, is shown by the domestic chicken. This would indicate the presence of a cognitive comparison of incentives. The magnitude of such a change may also provide a measure of the welfare impact of the change. In the first experiment, 16 groups of four broiler chicks were trained to run a maze to an area where they received a high quality test diet. After training, the test diet of eight groups was changed to a low quality diet that all groups had been receiving in their home pens. Compared to the control unchanged groups, the experimental birds took increasingly longer to run the maze on successive post-change trials; the decrease reaching significance on the fourth post-change trial ($P < 0.05$). The behaviour of the chicks on the day of the change was indicative of frustration, with greater activity and redirected foraging shown ($P < 0.05$). Although there was no definitive evidence of cognitive processing which would have been shown by an immediate decrease in approach speed, this may have been due in part to the testing of groups of chicks. However, the occurrence of a frustration reaction indicated that some cognitive representation of food quality may have been present. In a second experiment, individual adult hens were trained to run a runway for access to food or water, while food- or water-deprived, respectively. Every fourth trial in a total of 16 trials, access to the resource was thwarted by a clear plastic lid on the dish. Time taken to traverse the runway was significantly longer on the two trials following this experience ($P < 0.05$), with no effect of repetition of thwarting ($P > 0.05$), indicating that the experience of thwarting was aversive. These results indicated that chickens appear to be able to store and use information on incentives. Additionally, with appropriate experimental design, an incentive contrast paradigm might be used to assess birds' perception of the quality of changes in incentives.