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# CHANGES IN SOCIAL BEHAVIOR AND BRAIN CATECHOLAMINES DURING THE DEVELOPMENT OF ASCORBATE DEFICIENCY IN GUINEA PIGS

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ABSTRACT

Kaufmann, P., Wiens, W., Dirks, M. and Krehbiel, D., 1986. Changes in social behavior and brain catecholamines during the development of ascorbate deficiency in guinea pigs. Behav. Processes, 13: 13-28.

Behavioral patterns of pairs of guinea pigs were recorded in 15-min observation sessions on alternate days during a 6-day baseline phase and a 21- to 25-day period following the introduction of an ascorbate-free diet. Ascorbate-deficient animals were compared to two pair-fed control groups. During the last 5 days of the experiment, marked reductions in frequency and/or cumulative duration of active behaviors (e.g. locomotion, rearing, social grooming) were observed in the ascorbate-deficient group, while duration of inactivity in proximity to the test partner increased greatly. The decline in probability of locomotion was greater at long temporal lags (> 15 sec) after locomotion of the test partner than at short lags. Evidence of behavioral changes began to appear after 9-13 days on the ascorbate-free diet. Assays of brain tissue after sacrifice on the last day of the experiment revealed significant reductions in concentrations of ascorbate and norepinephrine. Some behavioral measures were highly correlated with brain ascorbate but not with brain norepinephrine, suggesting that other transmitter systems are involved in mediating the behavioral changes. The results also suggest the value of measurement of social behavior in assessing the behavioral effects of dietary or other treatments.

KEY WORDS

Ascorbate - guinea pigs - social behavior - catecholamines

## INTRODUCTION

Ascorbate deficiency produces a complicated pattern of behavioral and physiological changes (Hodges et al., 1969). In

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