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AGE-DEPENDENT CANNIBALISM IN A COLONY OF ALBINO RATS

by

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Cannibalism in laboratory animals is well known (Hart, 1934; Weaver & Bird, 1934; Perla & Sandberg, 1939; Hankin, 1960; Karmurthi, Sreenivasamoorthy & Parpia, 1972). It has been attributed to maternal nutritional deficiency (Hart, 1934; Carlson & Hoelzel, 1948; Hankin, 1960), environmental conditions such as over-crowding, boredom and parasitism (Wilson, 1949), toxic substances in the diet (Karmurthi, *et al.*, 1972), or to toxicity produced by an excess of certain vitamins or minerals in the diet (Perla & Sandberg, 1939). Weaver & Bird (1934) have attributed cannibalism to the loss of maternal instinct due to disturbances in the physical state of the mother rats. In the present study the effect of maternal age on mortality due to cannibalism and loss of maternal care is considered.

Altogether 240 female Wistar rats were used. They were kept in polypropylene cages fitted with stainless-steel wire-mesh bottoms, and housed in a vermin-proof room maintained at 28±2°C. Compressed absorbent cotton was used both as bedding and nesting material. The same commercial diet ('Rat and mouse feed'; Hindustan Lever Ltd, Bombay, India) was fed throughout the experiment.

Depending upon their age at pairing, the rats can be divided into 12 groups, each containing 20 animals. Except for Group 1, the rats were all parous, having produced from 1 to 6 litters. Pregnant rats were separated and individually maintained. From the day of birth up to weaning on Day 21, the young were counted daily between 0900 and 1000 hours. Young that were found partially eaten or missing were classified as 'cannibalised', whilst those found dead but intact were considered to have died from starvation or lack of maternal care.

The results are presented in Table 1. In the youngest females, paired at 2 to 6 months of age, the incidence of cannibalism was less than 10%, but it rose quite sharply to reach a maximum of 34% in females paired at 11-11.9 months of age (group 10). The level of deaths attributed to lack of maternal care or starvation remained relatively low (3-8%) in females paired up to 10 months of age (Groups 1 to 8), and then increased dramatically to a peak of 60% in those paired at 13-13.9 months of age (Group 12). In the 2 oldest

Table 1. Effect of maternal age on cannibalism in the rat.

each group contains 20 females.

Group	*Age of female at pairing (months)*	*mean litter size ± s.d.*	*% deaths before weaning due to cannibalism*	*lack of maternal care/starvation*
1	2-2.9	9.6±3.00	9.40	3.20
2	3-3.9	11.3±1.40	6.80	4.60
3	4-4.9	10.9±2.05	4.90	3.80
4	5-5.9	10.8±1.87	6.00	2.95
5	6-6.9	8.4±1.30	10.90	4.15
6	7-7.9	7.8±0.93	14.80	4.13
7	8-8.9	6.8±0.96	20.40	6.15
8	9-9.9	6.4±1.35	23.61	7.89
9	10-10.9	5.8±0.83	23.62	19.43
10	11-11.9	5.1±0.90	34.00	32.40
11	12-12.9	4.6±2.00	22.80	41.90
12	13-13.9	4.2±1.80	22.84	60.30

groups lack of maternal care or starvation accounted for 2-3 times as many deaths as did cannibalism. This age-dependent mortality is attributed to a disturbed physiological state of the mothers due to hormonal imbalance. Breeding capacity, e.g. litter size, was also significantly reduced after 9 to 10 months of age.

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