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Feather Eating as Stressor in the Muscovy Duck[1]

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(Received for publication March 19, 1964)

CONTRARY to the domestic duck, the Muscovy duck inclines to feather eating, not only if reared in confinement but also on range (Snyder, 1962). Severe feather eating presumably represents not only a physical stressor due to the loss of feathers and blood but also a mental one, considering the almost permanent anxiety and excitement of the birds in a feather eating flock. The effect of severe and slighter feather eating on growth and some endocrine glands was studied in two groups of ducklings in which a spontaneous outbreak of feather eating occurred at the ages of 3 and 5 weeks, respectively.

EXPERIMENTAL

In a little group of 6 Muscovy ducklings reared in confinement feather eating had already commenced at the age of 3 weeks when the first tail and wing feathers appeared. The birds continued to pull out feathers until they were almost plucked at the age of 10 weeks ("severe feather eating"). Four females of this group were then killed and compared with 5 females of another flock which were not feather eating.

In a second group of 4 male and 4 female ducks feather eating was observed after the 5th week. This feather eating did not become so severe, most feathers being incompletely plucked ("slight feather eating"). The birds were killed at the age of 10 weeks and compared with 6 males and 7 females which had been partially debeaked 2 weeks after hatching and were thus unable to pluck feathers. In these birds about a third of the "bean" or "nail" was removed by an electrical debeaker.

All animals were fed a usual starter and later a layer diet in pellet form *ad libitum*. In addition a vitamin concentrate was given.

The adrenals, thyroids, gonads as well as the anterior pituitary and the bursa Fabricii were removed and weighed on a torsion balance.

RESULTS AND DISCUSSION

Severe feather eating has a growth-inhibiting effect (Table 1). The adrenals and the anterior pituitary were significantly enlarged. The observed decrease in thyroid, gonad and bursa weight was not significant.

Slight feather eating inhibits growth to a similar degree (Table 1, Figure 1). The adrenal weight was not affected. Never-

[1] Supported by a grant of the Deutsche Forschungsgemeinschaft.

TABLE 1.—*Influence of feather eating on weight of body, adrenals, anterior pituitary, thyroids, gonads and bursa Fabricii*

	n	Body wt. in g.	Adrenals in mg.	Ant. pituitary in mg.	Thyroids in mg.	Gonads in mg.	Bursa in g.
Severe feather eating	4 ♀♀	1,615±33	76±3	7.7±0.17	82± 7	248±25	2.52±0.27
No feather eating	5 ♀♀	1,990±18	64±2	5.1±0.39	91± 7	295±22	2.83±0.42
Difference: P %		<0.001	0.003	<0.001	>0.05	>0.05	>0.05
Slight feather eating	4 ♂♂	2,732±118	127±5	8.4±0.65	123±10	209±14	2.67±0.18
No feather eating (partially debeaked)	6 ♂♂	3,083±76	128±9	7.3±0.36	121±11	293±20	3.63±0.13
Difference: P %		<0.001	>0.05	>0.05	>0.05	0.01	<0.001
Slight feather eating	4 ♀♀	1,630±45	70±5	4.1±0.35	88±10	266±13	2.42±0.09
No feather eating (partially debeaked)	7 ♀♀	1,930±25	66±3	3.7±0.13	104±5	275±17	3.39±0.16
Difference: P %		<0.001	>0.05	>0.05	>0.05	>0.05	0.002

theless, a higher corticosteroid release is presumed, since bursa weight was significantly decreased and a similar decrease of bursa weight occurs after administration of corticosterone or cortisol (Zarrow *et al.*, 1961). Gonad weight was lowered in both sexes, the difference in the males being significant.

There is no doubt that at least severe feather eating acts as a "stressor" in the sense of Selye (1952) and induces a general adaptation syndrome (GAS). The feather eating ducks showed the characteristic symptoms of the GAS, namely adrenal hypertrophy, bursa atrophy and an inhibition of growth. Young chickens exposed to various stressing agents respond in a similar manner as described for example by Garren and Shaffner (1952, 1956), Conner (1959), Newcomer and Connally (1960) and others. An enlargement of the anterior pituitary was also observed in stressed chickens (Garren and Barber, 1955; Siegel, 1960). The decrease of thyroid weight, though not significant, corresponds to a similar decrease in chickens after muscular fatigue (Garren and Shaffner, 1954). Not only the release of TSH, but also of gonadotrophins seems to be diminished in stress situations, considering the lowered gonad weight. This corresponds well to the known decrease in performance of laying hens under adverse conditions (Siegel, 1959; and others).

Prophylatical debeaking at the age of two weeks is recommended to prevent

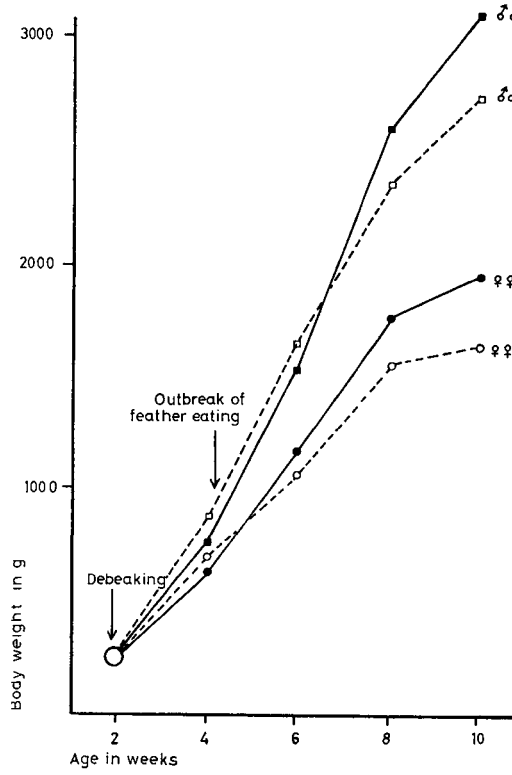

FIG. 1: Growth of Muscovy ducklings.
——— partially debeaked.
- - - - - not debeaked, feather eating.

feather eating. Besides a minimal negative effect on growth in the first two or three weeks after the procedure it proved to be without influence on later growth (Fig. 1). In this and in other experiments the debeaked birds attained the same 10-week weight as untreated ones, namely about 3000 g. in the males and 2000 g. in the females (Faber, 1964). It seems unnecessary to remove the upper mandible to a point posterior to the "bean" as described by Snyder (1962), if the debeaking is done before feather eating can occur, *i.e.* before the first tail feathers appear. A removal of about one third of the "bean" was sufficient in this trial and in 50 other birds to prevent feather eating. The treated birds were able to profit by the range, since grass or clover eating was still possible.

SUMMARY

Feather eating caused inhibition of growth, enlargement of adrenals and a reduction of bursa Fabricii in male and female Muscovy ducklings. The observed increase in pituitary weight as well as the thyroid and gonad weight decrease were not always statiscally significant.

Partial debeaking at the age of two weeks is recommended. It prevented feather eating and there was no influence on the growth.

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NEWS AND NOTES

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