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# CHICK COMB WEIGHT AND SPONTANEOUS MOVEMENT

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The increase in chick comb weight by androgen administration has been used for the biological assay of male hormone (1). Combs of young White Leghorn male chicks are most sensitive. For example, White Leghorns were observed to be fifteen times more sensitive than Rhode Island Reds and twenty times more sensitive than Barred Rocks. However, a large total dose of 80 ug. of male hormone applied to the combs of White Leghorn chicks did not produce a plateau on the dose-response curve (2). We, therefore, attempted to determine this plateau which, to our knowledge, has not been found. Furthermore, we consistently observed that chick movement in the brooder was greater when small amounts of androsterone or human urinary extract in oil were applied on the combs. An experiment was, therefore, designed to compare the androgen-induced comb weight increase with the rise in spontaneous movement.

## Materials and Methods

Young White Leghorn cockerels (10 to 13 chicks/group) were housed in brooders maintained at a temperature of 90°F from 2 to 9 days of age. Androsterone was administered daily for 7 days by inunction on each comb in 0.005 ml. sesame oil by means of a Hamilton microsyringe. Care was taken to spread the oil over the entire comb surface. The total amount of hormone placed on each comb during the test period ranged from 1 to 256 ug. Sesame oil without androsterone was applied to combs of control animals. Four hours after the last inunction, a pair of chicks were placed in a square metal cage

which rested on springs at each corner. Each spring contained a sponge rubber insert to reduce movement after the vibration (shock absorbers). A revolving smoked drum recorded chick movements for 15 minutes by means of a lever attached to the cage by a string arrangement. The average spontaneous movement/minute was obtained from 6 or 7 pairs of chicks in each group.

The chick combs were removed and weighed on day 8 of the experimental period. Comb weights were expressed in terms of final body weight--mg./ 100 gm. body weight. Relative comb weight takes into account comb growth due to changes in body weight. The present chick comb weight procedure is a modification of the method employed by Lerner et al. (3). The apparatus used to measure spontaneous movement was designed and constructed in the laboratory. The slightest movements were recorded as spikes on the revolving smoked drum and the spikes were then counted. The standard error for each mean value was calculated and the number of measurements are listed in parenthesis in Table 1. Student's "t" test was the statistical procedure used to test for significance.

## Results and Discussion

The comparative effect of increasing doses of androsterone on chick comb growth and spontaneous movement is shown in Table 1. The average relative comb weight of control animals was 22.9 mg. Combs removed from the group receiving 1 ug. of androsterone had an average weight of 43.2 mg./ 100 gm. body weight. The difference in comb size between the two groups was highly significant ($P<0.001$). The increase in comb weight produced by 1 ug. of hormone was 88.8%. A dose of 256 ug. resulted in a 671.2% increase in comb weight over controls. A plateau on the dose-response curve was not found. It was demonstrated that a dose-response relationship existed over the entire range of 1 to 256 ug. Higher androsterone dose levels are required to clarify this point. In fact, doses lower than 1 ug. should be tested to more clearly define the lower end of the curve. It is tempting to