

Effect of Desoxycorticosterone* on Pituitary and Lactogen Content.†

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Several of the sex hormones capable of eliciting mammary growth can also increase the weight of the pituitary and augment its content of lactogenic hormone. At least 2 estrogens, estrone and estradiol benzoate, have been shown to possess these properties.¹ Testosterone propionate, another mammary growth-promoting substance, can augment the lactogen content of the pituitary but does not increase the size of the gland.² Androsterone, which does not stimulate mammary growth,³ fails to influence either the size of the pituitary or its lactogen content.⁴

Van Heuversvyn, *et al.*,⁵ have demonstrated that desoxycorticosterone acetate (DCA), a synthetic adrenal cortical hormone, can induce growth in the mammary glands of male mice. Recently this has been confirmed by Lewis and Turner (unpublished). It was of interest, therefore, to determine whether DCA, like estrone, estradiol benzoate and testosterone propionate, would also increase the size of the pituitary or raise its lactogen content.

Forty-four guinea pigs were placed in 5 groups of experimental and control animals. From 7 to 20 mg of DCA in sesame oil were administered subcutaneously over periods ranging from 10 to 20 days. To show the comparative effects of estrogen, an additional group of 8 male guinea pigs were injected subcutaneously with 3000 I.U. of estrone over a period of 15 days and run against 6 control animals. The pituitaries of each experimental and control group were macerated separately in a small agate mortar, taken up in a little distilled water, and assayed by the Reece-Turner pigeon method.¹

* The desoxycorticosterone acetate was kindly furnished by Dr. Erwin Schwenk of the Schering Corporation.

† Contribution from the Department of Dairy Husbandry, Missouri Agricultural Experiment Station, Journal Series No. 751.

1 Reece, R. P., and Turner, C. W., *Mo. Agr. Exp. Sta. Bul.* 266, 1937.

2 Reece, R. P., and Mixner, J. P., *PROC. SOC. EXP. BIOL. AND MED.*, 1939, **40**, 66.

3 Nelson, W. O., and Gallagher, T. F., *Science*, 1936, **84**, 230.

4 Reece, R. P., *PROC. SOC. EXP. BIOL. AND MED.*, 1941, **46**, 265.

5 Van Heuversvyn, J. E., Folley, S. J., and Gardner, W. U., *PROC. SOC. EXP. BIOL. AND MED.*, 1939, **41**, 389.

The data (Table I) relative to the size of pituitary and lactogen content was treated by the analysis of variance as described by Snedecor.⁶ A significant increase in weight was found in the pituitaries of the DCA treated animals. However, the difference between the lactogen content of the pituitaries of the experimental and DCA treated guinea pigs was found to be insignificant. It will be noted that in the estrone-treated guinea pigs there was at least a three-fold increase in the lactogen content of the pituitary. The mammary glands of the female guinea pigs receiving the lowest dosage of DCA, 7 mg, were examined and compared with the mammary glands of its control mates by Dr. A. A. Lewis of this laboratory, and found to show considerable lobule hyperplasia. The dosages of DCA employed did not produce any noticeable change in the adrenal weights of the experimental animals.

It is concluded that DCA acts similar to some of the sex hormones to the extent that it can stimulate the growth of the mammary glands and increase the weight of the pituitary, but is unlike these hormones in that it does not cause an augmentation of the lactogen content of the AP.

Summary. Three groups of female and 2 groups of male guinea

TABLE I.
Effect of DCA on Pituitary and Lactogen Content.

Sex	Guinea pigs No.	Treatment	Length of treatment, days	Avg body wt, g	Avg adrenal wt, mg	Avg pituitary wt, mg	Avg pituitary wt/100 g body wt	Avg No. R.T.* units per pituitary	Avg No. R.T. units /100 g body wt
♀	5	Controls		417	229.8	9.88	2.13	6.24	1.25
♀	5	7 mg DCA	10	427	201.2	12.36	2.84	7.10	1.66
♀	5	Controls		405	207.9	11.46	2.80	6.20	1.53
♀	5	15 mg DCA	15	439	206.7	15.48	3.53	6.75	1.53
♀	2	Controls		403	204.2	10.52	2.64	6.00	1.48
♀	2	20 mg DCA	20	419	213.6	14.95	3.56	5.75	1.37
♂	6	Controls		336		10.05	2.98	3.03	.90
♂	8	3000 I.U. estrone	15	304		10.87	3.57	12.75	4.19
♂	5	Controls		340	164.9	9.56	2.74	3.12	.91
♂	5	15 mg DCA	15	344	170.0	12.36	3.60	3.64	1.05
♂	5	Controls		205	69.4	5.71	2.79	2.90	1.41
♂	5	10 mg DCA	10	184	88.0	6.44	3.51	2.40	1.30

*Reece-Turner lactogen units. 22.2 R.T. units = 1 International Unit (Meites, J., Bergman, A. J., and Turner, C. W., *Endocrinology*, 1941, **28**, 707).

⁶ Snedecor, G. W., *Statistical Methods*, 3rd Edition, 1940, p. 179. We are indebted to Mr. M. Koger for the statistical analysis of the data.

pigs were injected with 7 to 20 mg of desoxycorticosterone acetate to determine its effect on pituitary weight and on the lactogen content of the AP. A significant increase in pituitary weight was obtained, but there was no increase in the lactogen content of the AP.

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Effect of an Ant. Hypophyseal Extract upon Serum Calcium and Phosphorus.

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The elaboration of a parathyreotropic factor by the anterior hypophysis has been indicated by work from a number of sources. The literature in this connection has been reviewed recently by Friedgood and McLean.¹

These workers have presented data establishing a statistically significant increase in the serum calcium of guinea pigs receiving daily injections of 1 cc of an alkaline pituitary extract* over a period of 9 days. Friedgood² has also published data indicating an elevation in the serum calcium level of white rats under similar conditions. In 4 rats, each of which had received daily subcutaneous injections of 1 cc of the extract for a period of 6 days, values for serum calcium were found to be 12.8, 12.6, 12.5, and 11.7 mg %, respectively. Two control animals showed serum calcium levels of 10.7 mg %. Four other rats were given intraperitoneal injections of 1, 2, 3, and 4 cc of the extract, respectively, twice daily and sacrificed on the second day. Their blood calcium values were found to be 12.7, 12.3, 10.1, and 10.3 mg %, respectively. No control values were reported.

In view of the small number of rats which were used to test the reactivity of this animal to the extract, and the inadequacy of the control values, it appeared to us that the suitability of the rat for the assay of the so-called parathyreotropic factor should be further investigated.

Albino rats, varying in age from 99 to 281 days and in weight

¹ Friedgood, H. B., and McLean, R., *Am. J. Physiol.*, 1937, **118**, 588.

* Obtained from E. R. Squibb and Sons.

² Friedgood, H. B., *Endocrinol.*, 1936, **20**, 159.