

the muscle about 10% less than the amount measured by the chemical method, which is probably within the limits of error of the methods.

There was little doubt that the rancidity as detected by the judges and indicated by the peroxide numbers was slowed by addition of tocopherols to the diet just previous to slaughter. The shortest period of supplementation, 2.5 days on feed containing either 1 or 2% tocopherols, appeared to afford little protection against rancidity although some increase in tissue tocopherol occurred. The longest period, 35 days at 0.1% addition was effective up to 9 months storage, but the same period of supplementation at the 0.01% level was ineffective. The 21-day feeding at 1% level was most effective of all and the same level maintained for only 7 days nearly as good. The lowest effective level used therefore was 0.1% of the feed for 35 days but at 1% nearly as effective protection was obtained by 7 days feeding.

Major and Watts(5) noted no protection of rabbit meat when 400 mg mixed tocopherols was fed with a natural feed 3 weeks before sacrifice of the animals. The amount and continuity of the dosage may have been insufficient. Our observations confirm the conclusions of Chipault *et al.*(3) and Carpenter and Lundberg(6) as to relationship of tocopherol content and keeping quality of

hog fats.

Summary. Mixed tocopherols, about one-half α and the rest chiefly γ , fed to 28 female turkeys for 2.5 to 35 days before slaughter at levels 0.01, 0.1, 1 or 2% of the feed produced measurable increases in the tocopherol content of liver, heart, gizzard and muscle. The 0.1% level fed for 35 days produced the most efficient transfer of tocopherol, but the total amount of the supplement retained in this and the other groups was extremely small. The liver usually contained more tocopherol than any other tissue, 23 to 225 mg per kg fresh tissue, the heart contained 28 to 145, the gizzard 15 to 45, the leg muscle 11 to 50, and the breast muscle 8 to 25. Bioassay of liver and leg muscle indicated the presence of α -tocopherol in amounts within 10% of those obtained by the chemical procedure. No relationship was found between the tocopherol and the vit. A and carotene contents of the 15 livers examined. The peroxide numbers of the fat under the skin and the abdominal fat before and after frozen storage for 3, 5, 6, or 9 months were progressively greater with storage and with decreasing amounts of tissue tocopherol. The acceptability of meat and fat and the detection of rancidity to taste by a panel of judges fell in the same order as the peroxide numbers.

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A Non Adrenal-Mediated Action of ACTH on the Preputial Glands. (18967)

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Various steroids, particularly testoids, stimulate the growth of the preputial glands, both in male and in female rats(1). It has been shown, furthermore, that certain pituitary extracts, which in themselves are almost in-

active, greatly augment the preputial gland stimulating effect of certain steroids(2,3). Although these pituitary extracts were rather rich in corticotrophic potency, some of the earlier investigators felt their effect upon the

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1. Selye, H., Textbook of Endocrinology, *Acta Inc. Med. Publ.*, Montreal, Canada (1949).

2. Noble, R. L., and Collip, J. B., *Endocrinology*, 1941, v29, 943.

3. Selye, H., and Clarke, E., *Rev. Canad. de Biol.*, 1943, v2, 319.

TABLE I. Effect of 6 Days Treatment with ACTH.

Group	Treatment	Body wt, g		mg	Wt of the preputial glands mg/100 g body wt
		Initial	Final		
I	Hypertensinogen	108	109	30.1	27.9 $\pm$ 2.2
II	ACTH	108	104	44.6	43.4 $\pm$ 2.3

TABLE II. Effect of 9 Days Treatment with ACTH.

Group	Treatment	Body wt, g		mg	Wt of the preputial glands mg/100 g body wt
		Initial	Final		
I	Hypertensinogen	110	129	32.4	25.3 $\pm$ 1.2
II	ACTH	110	108	44.8	40.8 $\pm$ 2.7

preputial glands was due to some pituitary principle other than ACTH(2). Until a short time ago, it was generally assumed that ACTH exerts all its effects only through the adrenal cortex(1). However, recent observations made in this Institute demonstrated that in adrenalectomized rats, maintained on threshold doses of cortisone, ACTH causes pronounced thymic involution. Hence, it was assumed that the hormone must possess some extra-adrenal effect, even though the latter fails to manifest itself in the absence of corticoids(4).

In the present communication we wish to report upon observations concerning an extra-adrenal action of ACTH on the preputial glands. Since the latter are sensitive to sex hormone stimulation, all experiments were performed on animals both adrenalectomized and ovariectomized.

As we shall see, a definite preputial gland stimulation was obtained in these experiments in the absence of both steroid producing glands and of any sensitization by steroids.

Experimental procedure. Two experiments were performed on a total of 40 female piebald rats. In each of these we used 2 groups of 10 rats. The first group received *hypertensinogen* in order to determine the possible effect of non-hormonal foreign protein. This was given at a daily dose level of 6 mg, in the form of 6 subcutaneous injections of 1.0 mg in 0.1 ml of saline, every 4 hours.

ACTH (Connaught Laboratories, Toronto, Lot No. 2-2, 3-1) was given at the same dose

level and in the same manner as the hypertensinogen. It will be recalled that in order to obtain maximal adrenal stimulation effects from ACTH, it is essential to give it at short intervals; hence, the injections were made every 4 hours during the day and night.

All the experimental animals, in the 2 series, were bilaterally *adrenalectomized and ovariectomized*, 48 hours before the initiation of the injections. Immediately after this, they were given 1% NaCl, instead of tap water as a drinking fluid. The removal of the gonads and adrenals was necessary in order to eliminate both of the known endogenous sources of hormones.

The 2 experimental series differed only in that injections were given in the first experiment during 6 days, and in the second during 9 days. At the end of each experiment, the animals were killed by exsanguination and their preputial glands removed for weighing, and histological study.

Experimental results. The details of the experimental arrangement, the initial and final body weights as well as the weight of the preputial glands expressed in mg and in mg per 100 g of B.W. (the latter with its standard error) are given in Tables I and II. It will be noted that ACTH increased the weight of the preputial glands. Statistical analysis of this difference showed that the augmentation was significant; the value of "P" in comparing the weights of the preputial glands in mg per 100 g was <0.01 in both experiments. Histologic study of these glands showed bigger and more regular acini in the animals treated

with ACTH than in the animals treated with hypertensinogen (see Fig. 1 and 2).

Summary. Experiments on adrenalectomized and ovariectomized rats indicate that ACTH stimulates the growth of the preputial glands, even in the absence of both steroid producing endocrines. It is concluded that ACTH possesses actions which are not mediated through either the adrenals or the gonads and which do not even depend upon

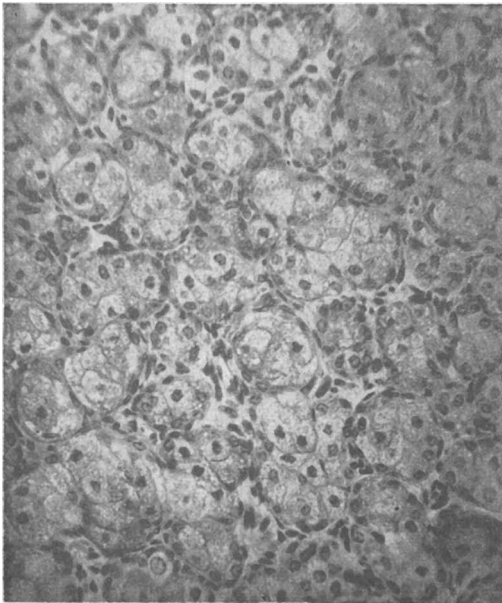


FIG. 1. Preputial gland of a rat treated with hypertensinogen.

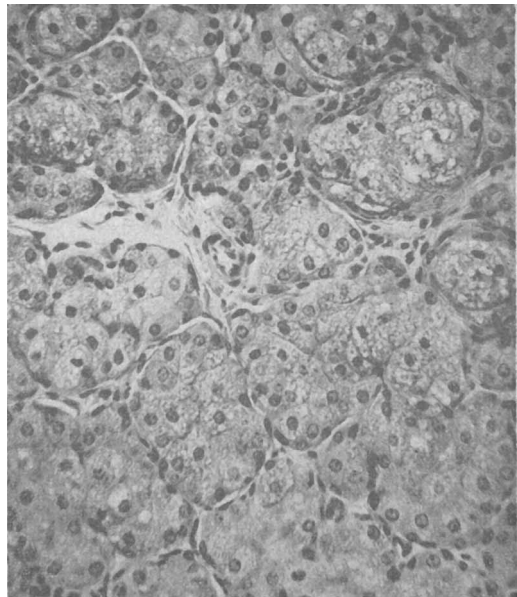


FIG. 2. Preputial gland of a rat treated with ACTH.

the simultaneous presence in the body of adrenal or gonadal hormones. It remains to be seen whether this action is due to the corticotrophic hormone itself or to some contamination in the ACTH preparation used.

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Splanchnic Removal of Bacteria from Blood Stream of Pyrogen-Tolerant Rabbits.* (18968)

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The tolerance produced by the repeated intravenous injection of pyrogenic materials is associated with the development of resistance to the Schwartzman phenomenon(1).

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1. Bennett, I. L., and Cluff, L. E., in mss.

Both pyrogen-tolerance and resistance to the Schwartzman phenomenon are blocked by the injection of thorotrast†(2,3). Since the

† A stabilized colloidal thorium dioxide prepared by the Heyden Chemical Corp.

2. Beeson, P. B., *J. Exp. Med.*, 1947, v86, 39.

3. Beeson, P. B., *Proc. Soc. Exp. Biol. and Med.*, 1947, v64, 146.