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Bioassay of Galactin, the Lactogenic Hormone.

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The increase in the crop weight of the common pigeon, while a valuable qualitative test, was found unsatisfactory in the quantitative assay of galactin due to the variability of groups of birds to the same amount of hormone. As the further purification of galactin requires a reliable bioassay, a more accurate method was sought.

Instead of weight, the minimum proliferation of the crop gland was found more satisfactory. This degree of crop growth is characterized by the presence of transverse strands or lobules of cellular development and considerable opaqueness when the crop is extended.

In the assay of the estrogenic hormone, Coward and Burn[1]

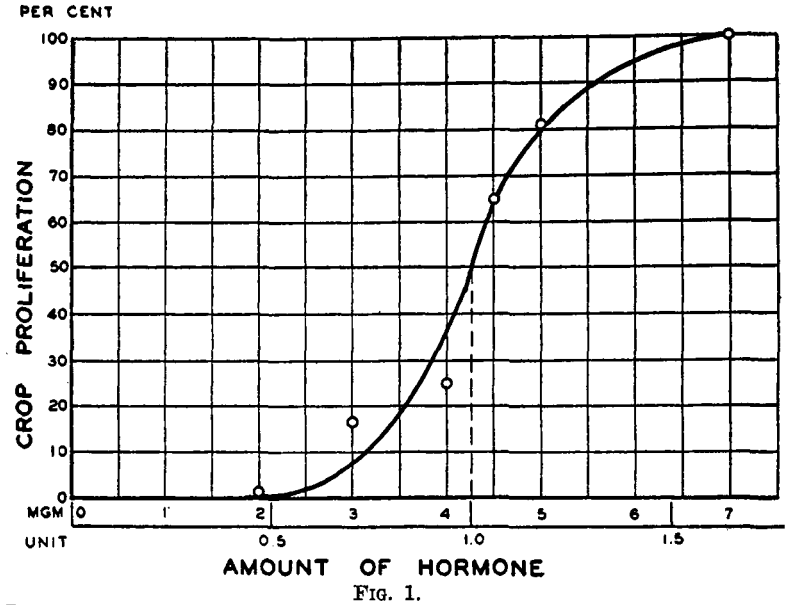

FIG. 1.

Relation between amount of hormone injected and percentage of pigeons showing crop gland proliferation. Relation is described by a characteristic sigmoid curve which indicates extreme sensitivity to small amount of hormone in region of 50% response. The pigeon unit is based upon this curve, one unit of the hormone being the amount required to give a 50% response.

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[1] Coward, K. H., and Burn, J. H., *J. Physiol.*, 1927, **63**, 270.

made use of the variation in the response of rats as indicated by the percentage showing a positive reaction at various levels of administration. The adaptability of this method of bioassay to galactin has been studied. A characteristic sigmoid curve with maximum sensitivity in the region of 50% response was obtained (Fig. 1). An assay method has therefore been devised using minimum proliferation combined with the principle of percentage response.

The details of the assay method follow: Common pigeons weighing from 260 to 340 gm. are used. The light young birds and the very heavy birds are less uniform in their response. As no sex difference has been noted, both males and females may be used. Experience indicates that about 20 birds should be used. The extract is injected once daily for 4 days just beneath the subcutaneous tissue into the breast muscle.† The crop glands are examined on the 5th day for proliferation.

A pigeon unit of galactin is defined as the total amount of hormone injected during a period of 4 days which will cause a minimum but definite proliferation of the crop glands of 50 ± 11% of 20 common pigeons weighing 300 ± 40 gm.

The results obtained by this method using a desiccated anterior pituitary powder (Table I) indicate that the method is quite accurate in the region of 50% response.

TABLE I.

Dose of Hormone Mg.	Positive Responses %
14	79
13	100
9	41
9	38
10	53
10	53

According to Burn[2] the standard deviation of a group of 20 animals showing a 50% response is ± 11%, and 2 out of 3 assays should fall within this limit. If twice the standard deviation be taken, then 21 out of 22 assays will fall between that limit.

†If a more sensitive test is desired the injection of the extract intradermally over the crop gland as described by Lyons and Page, PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1049, may be employed.

[2] Burn, J. H., *Physiol. Rev.*, 1930, **10**, 146.