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Lactogen Content of Female Guinea Pig Pituitary.

R. P. REECE.* (Introduced by W. C. Russell.)

From the Department of Dairy Husbandry, New Jersey Agricultural Experiment Station.

Previous observations¹ indicated that pituitary glands from lactating guinea pigs contained more lactogen than did glands from sexually mature, non-pregnant, and non-lactating guinea pigs. The intent of this assay work was to compare the lactogen content of pituitary glands from guinea pigs sacrificed in estrum, diestrum, early pregnancy, late pregnancy, and lactation.

Series I. Animals were paired on the basis of body weight, the average body weight of each group being approximately the same. Six guinea pigs were sacrificed in each of the previously mentioned stages.

Series II. Six animals were sacrificed in early pregnancy, late pregnancy, and lactation. However, the average body weights of these groups varied considerably. Lactating animals in both series were sacrificed on the 11th day of the lactation period, the young having been removed 15 hours previously.

The pituitary glands were removed, weighed, and assayed for their lactogen content by injecting the suspended tissue intradermally over the crop glands of common pigeons.

In Series I the pituitary gland of an animal in one group was compared with the gland from an animal of similar body weight in each of the 4 other groups. In Series II the pituitary gland of an animal in one group was compared with the gland from an animal in each of the 2 other groups. In each comparison one-fourth of a pituitary gland was injected over the right crop gland of 3 pigeons and one-fourth of another pituitary gland over the left crop gland of the same 3 pigeons.

In Series I the pituitary glands from guinea pigs in estrum contained slightly more lactogen than did those from animals in diestrum and early pregnancy and slightly less lactogen than did those from guinea pigs in late pregnancy and lactation. Pituitary glands from animals in diestrum contained less lactogen than did those from any of the 4 other groups. In the early pregnancy group the

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

pituitary lactogen content was less than that from animals in estrum, late pregnancy, and lactation and slightly more than that from animals in diestrum. With the exception of animals in lactation, the pituitary lactogen content of the late pregnancy group was more than that of any of the 4 other groups. The pituitary glands from animals in lactation contained more lactogen than did those from animals in any of the 4 other groups.

TABLE I.
Lactogen Content of Guinea Pig Pituitary Gland.

No. of comparisons	Physiological condition	Avg body wt when sacrificed, g	Avg pituitary wt, mg	Avg No. B.U.* per pituitary gland
Series I				
6	{ Estrum	564	10.9	16.7
	{ Diestrum	556	12.4	13.4
6	{ Estrum			13.6
	{ Early pregnancy	548†	12.2	12.8
6	{ Estrum			12.8
	{ Late pregnancy	553†	12.2	15.2
6	{ Estrum			13.5
	{ Lactating	562	13.5	15.5
6	{ Diestrum			12.8
	{ Early pregnancy			16.0
6	{ Diestrum			13.4
	{ Late pregnancy			14.2
6	{ Diestrum			14.0
	{ Lactating			15.5
6	{ Early pregnancy			13.7
	{ Late pregnancy			15.3
6	{ Early pregnancy			11.6
	{ Lactating			13.9
6	{ Late pregnancy			12.9
	{ Lactating			14.7
Series II				
6	{ Early pregnancy	658†	14.8	12.3
	{ Late pregnancy	689†	16.2	12.0
6	{ Early pregnancy			12.2
	{ Lactating	841	20.9	16.5
6	{ Late pregnancy			11.2
	{ Lactating			16.5

{ Assayed in the same group of birds.

* Bird units.

† Body wt minus fetal wt.

In Series II there was no difference in the lactogen content of pituitaries from animals in early pregnancy and late pregnancy. As in Series I, the pituitary glands from animals in lactation contained more lactogen than did those from animals in early and late pregnancy. These results are summarized in Table I.

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Plasma pH, CO₂ Content of the Blood and "Tissue Gas" Tensions During Hibernation.

R. T. STORMONT, MARK A. FOSTER AND CARL PFEIFFER. (Introduced by M. H. Seevers.)

From the Departments of Pharmacology, Universities of Wisconsin and Chicago, and the Department of Neurology and Psychiatry, University of Wisconsin.

An increased CO₂ content of the blood as well as a reduction in body temperature occurs in the European marmot during "winter-sleep" according to Dubois,¹ who used these data as support for his carbonic auto-narcosis theory of hibernation. Rasmussen^{2, 3} has shown that the CO₂ content of the arterial and venous bloods of woodchucks is increased, but that the CO₂ absorbing power of the blood is decreased during hibernation. The pH of the blood during hibernation, however, has not been determined.

Foster⁴ has observed that hibernation can be induced in a large percentage of well fattened and sexually inactive ground squirrels (*Citellus tridecemlineatus*, Mitchill) if, after water is withheld for 48 hours, they are placed in a cold room at 32°-40°F. This procedure was used in these experiments on the same species of ground squirrels. The animals which did not hibernate despite the above procedures are termed "non-hibernators" in this study, although it is possible that they would have hibernated had they been given sufficient time.

Two separate studies have been undertaken. The first has been concerned with the determination of the hematocrit, plasma pH, and CO₂ content of arterial blood by the micro-method of Shock and Hastings.⁵ In this study 4 normal, 9 hibernating, and 7 "non-

¹ Dubois, R., *Compt. rend. soc. biol.*, 1894, ser. x, i, 821.

² Rasmussen, A. T., *Am. J. Physiol.*, 1915, **39**, 20.

³ *Ibid.*, *Am. J. Physiol.*, 1916, **41**, 162.

⁴ Foster, M. A., Foster, R. C., and Meyer, R. K., *Endocrinology*, 1929, **24**, 603.

⁵ Shock, N. W., and Hastings, A. B., *J. B. C.*, 1934, **104**, 565.