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Ovarian Hormone Content of Pregnant Cow's Urine.

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The oestrous producing hormone has long been believed to be one of the chief causes of the development of the mammary glands during pregnancy. However, it was not until Fels[1] discovered the presence of the hormone in the blood during pregnancy, and further, that it was being excreted in large quantities in the urine during late pregnancy (Veler and Doisy[2]) was the fact established that the hormone is actually present in the blood and is being excreted in the urine. Recently Hisaw and Meyers[3] reported the presence of the hormone in the urine of a limited number of pregnant cows.

These fundamental observations are of great importance in the study of the causes of the development of the mammary gland. First, it is important to correlate the changes in the developing gland with the concentration of the hormone during various stages of pregnancy; and second, to determine the relation between the variation in the concentration of the hormone and the variation in the size of the gland and subsequent milk secretion. The purpose of the present communication is to present the results of a preliminary study having the above objectives.

The urine from 34 cows in various stages of gestation has been analyzed for its hormone content, using the Allen and Doisy[4] rat unit test. Doisy (unpublished work) has found that the hormone is absorbed by oil when mixed with urine in which it is present. In this series of tests, the oil was cleared in a centrifuge and injected. While this method of extraction may be considered only approximately quantitative, a rigid uniformity of procedure makes the results of comparative value.

The results are shown in Fig. 1. It will be noted that during the first one hundred days of pregnancy the daily excretion of the hormone is slight, averaging about 50 rat units. Following this period the average daily excretion begins to increase. This increase is at

[1] Fels, E., *Klin. Woch.*, 1926, v, 2349.

[2] Veler, C. D., and Doisy, E. A., PROC. SOC. EXP. BIOL. AND MED., 1928, xxv, 806.

[3] Hisaw, F. L., and Meyer, R. K., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 586.

[4] Allen, E., and Doisy, E. A., *J. Am. Med. Assn.*, 1923, lxxxi, 819.

the rate of approximately 3.5 to 4 rat units per day until parturition. However, there was found considerable variation in the daily excretion of individual animals. This variation was found to be correlated to some extent with the previous yearly milk and butterfat production.

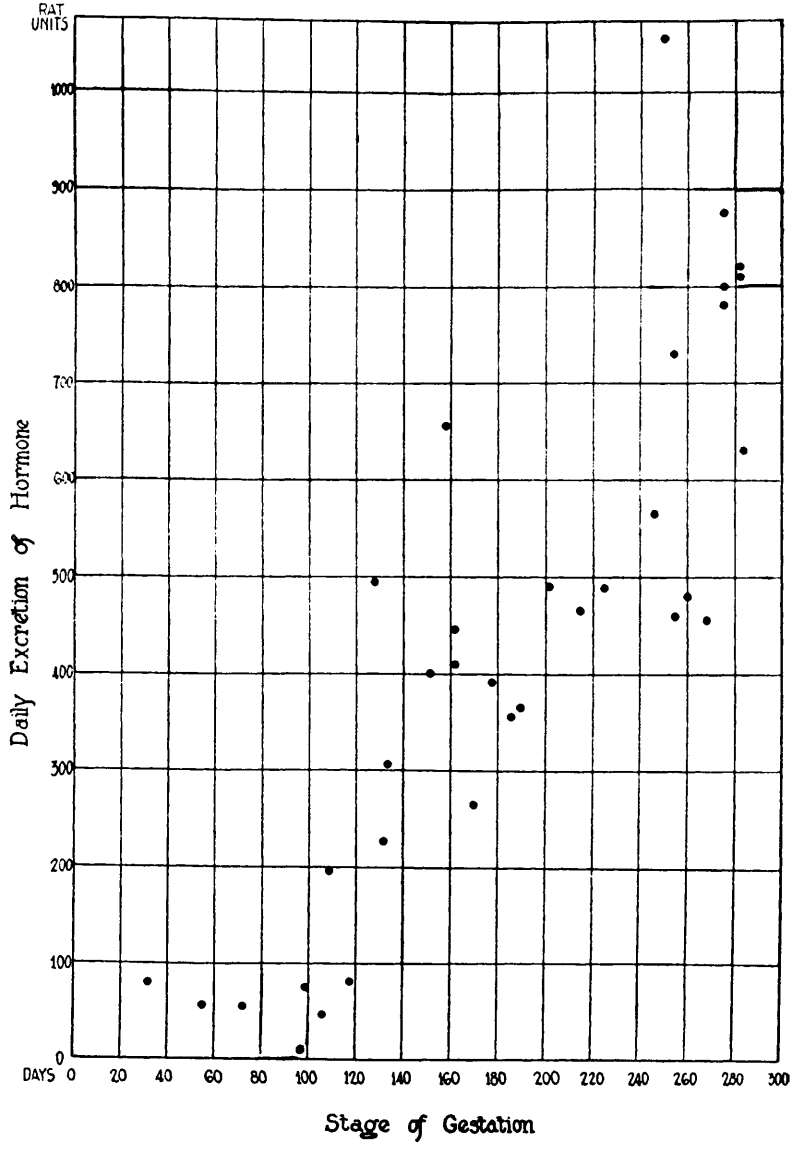

FIG. 1.

The variation in the average daily excretion of the ovarian hormone as extracted from cow's urine in different stages of gestation.

If the excretion of the hormone in the urine is a measure of its effective concentration in the blood during pregnancy, these observations may account for the rapid growth of the mammary gland during the latter stages of primigravida animals and also the variation in their subsequent milk and butterfat production.

[5] Loewe, S., *Klin. Woch.*, 1926, v, 576.