

Conclusions. Human blood from which the riboflavin has been removed by irradiation contains some factor which enhances the growth-promoting (acid production) activity of riboflavin on *Lactobacillus casei* ϵ . In the future, investigators who make determinations of the riboflavin content of blood or other biological materials must take into consideration the presence or absence of this factor.

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Effects of Sex and Gonadotropic Hormones on Red Cell Counts of Rats.

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In a previous communication,¹ we have reported that normal female rats, injected for 2-3 months with pregnant mare serum hormone showed an erythrocyte count well below normal. Since hypophysectomy is also followed by an anemia,² it seemed to us that a broad investigation of sex and gonadotropic effects on the blood picture might serve to clarify the so-called hemotropic action of the anterior pituitary.

In the first series of experiments, determinations were made upon groups of normal and castrated animals injected daily with different hormone preparations.* The red cell counts of 47 normal mature rats of our colony were found to vary from approximately 8.0-9.0 million per mm³, and averaged about 8.5 million per mm³. Eight normal females injected daily for 2 months with 15 r.u. Gonadin revealed an average red cell count of 7.5 million per mm³. The average red cell count of 11 normal males treated for 2 months with 10-15 r.u. Gonadin was 10.1 million per mm³. Eleven untreated castrate females, 2 months after the operation possessed an

¹ Gordon, A. S., Levenstein, I., and Charipper, H. A., *Proc. Am. Physiol. Soc.*, 1940, 68.

² Vollmer, E., Gordon, A. S., Levenstein, I., and Charipper, H. A., *Endoc.*, 1939, 25, 970.

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average count of 9.4 million per mm^3 . Daily injections, for 2 months, of 5 r.u. estradiol into 5 castrated females lowered the red cell count to 7.8 million per mm^3 . The counts of 5 castrated females, injected daily for 2 months with 0.5 mg testosterone averaged 9.8 million per mm^3 . The red cell counts of castrated rats injected with Gonadin, sesame oil, or normal horse serum remained unaltered.

In the second series of experiments, hypophysectomized rats were employed. We have already shown² that complete hypophysectomy in rats is followed by a decline in red cell count which reaches 60-70% its normal value after about 2 months. Three females, hypophysectomized 6 weeks previously, showed no response to daily injections of 15 r.u. Gonadin (average, 6.1 million per mm^3), but 4 hypophysectomized males attained and, in 2 cases, surpassed the normal levels (average, 9.0 million per mm^3) at the end of one month of treatment. The same dosage of pregnant mare serum did not prevent 3 females from revealing the usual post-hypophysectomy anemia when injections were begun immediately following the operation. The average red cell counts of 3 hypophysectomized males and 3 hypophysectomized females, injected daily with control doses of normal horse serum (0.3 cc) were unchanged. Daily injections of 20 i.u. Pranturon were found to have little effect on the blood picture of 3 hypophysectomized males and 3 hypophysectomized females.

The most striking effects were obtained with male sex hormone. Six hypophysectomized females and one hypophysectomized male, injected daily with 1.0 mg testosterone (in sesame oil) showed gains of from 2-4 millions per mm^3 in one month. Testosterone injections, in most cases, evoked a reticulocytosis (as high as 10%). Hemoglobin values showed constant gains but did not reach normal levels. Injections of sesame oil were without effect.

Summary. 1. Pregnant mare serum hormone, when injected into normal and hypophysectomized males, causes an elevation in red cell count. Injections of testosterone into castrated females or hypophysectomized males and females likewise increase red cell count. 2. The red cell counts of normal females treated with pregnant mare serum hormone are lowered, those of castrate or hypophysectomized females, similarly treated, remain unchanged. Estradiol lowers the counts of normal females. 3. It seems possible that the gonadal secretions are responsible, to some extent, for the sex difference in normal red cell count encountered in many species of animals.