

unfractionated pituitary extracts but failed to augment the follicle-stimulating and luteinizing fractions when these were used alone. However, when the 2 fractions were combined, to simulate the unfractionated extract, the augmentive action of male urine was apparent. The action of gonadotropic preparations of extra-pituitary origin, such as urine of pregnant women and blood serum of pregnant mares, is not augmented by the male urine (Table I).†

The milk, egg, liver, thyroid, and lemon extracts were prepared by dehydrating the raw material with excess acetone and extracting the residues with aqueous pyridine. These preparations were combined with unfractionated pituitary extracts only. From 3 to 6 test rats were used to demonstrate the augmenting activity in each preparation, and the results show that the effects of the unfractionated pituitary extract were markedly augmented in each case.

The augmentive action of male urine appears similar to that of extracts from the other sources. Active preparations of male urine are soluble in water, dilute acids and bases, low concentrations of acetone and alcohol, and are precipitated by tannic acid and by high concentrations of alcohol or acetone. These preparations are stable to boiling, but are destroyed by incineration. They are not effective when given orally.

8453 C

Relative Gonadotropic Augmentive Action of Plasma and Formed Elements from Blood of Cattle.*

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That the blood of cattle contains a substance which interacts with certain anterior pituitary extracts in a manner which enhances the ovary-stimulating effect of the latter was shown first by Evans,

† Investigations similar to these reported here, involving augmenting activity from the blood of cattle, have been carried on by Dr. L. E. Casida,⁵ with similar results. Likewise, the blood of pregnant and non-pregnant mares, in their reactions with the various gonadotropic preparations, appear identical with those of the human male urine and blood of cattle (unpublished data).

⁵ Casida, L. E., *J. Dairy Science*, 1935, **18**, 430.

* Paper from the Department of Genetics, Agricultural Experiment Station, University of Wisconsin, No. 197. Published with the approval of the Director of the Station.

*et al.*¹ An attempt has been made in the present study to determine more specifically the portion of the blood which is responsible for the augmentation.

It has been noted earlier² that there was no apparent correlation between the stages of the reproductive cycle represented by the donor cattle and the augmentive power of their blood serum. These serum samples were decanted from clotted blood. It has since been noted that the amount of augmentation from a standard amount of such serum appears in some cases to be proportionate to the redness of the serum, *i. e.*, the amount of hemolysis that has occurred.

Tests have been made of clear plasma and of the sediment or formed elements which were thrown down by centrifugation of freshly drawn citrated blood. The latter were washed 3 times with approximately equal volumes of physiological saline. Test samples of both plasma and sediment were combined with 50% pyridine-33% acetone soluble sheep pituitary extracts prepared by the method of Fevold, *et al.*³ Seven samples of blood from 4 different animals have been tested in this way (Table I).

TABLE I.
Augmentive Action of Plasma and of Formed Elements from 1.67 cc. Cattle Blood.

Blood Sample	Reproductive State of Donor	Average* Ovarian Weights of rats receiving		
		A.P. alone	A.P. + plasma	A.P. + formed elements
7CA	103 days preg.	22	32	86
28CA	130 " "	29	37	90
11CA	125 " "	38	33	78
832A	Immature bull	49	56	100
FMA	252 days preg.	64	93	118
832B	Immature bull	39	36	105
832C	" "	36	39	121
Total No. Test Rats		20	20	20
Mean Ovarian Wt.		39.9±3.4	46.9±5.5	98.5±5.3

Mean difference—Ovarian Wt. of test animals:

A.P. alone and A.P. + plasma = 7.0 ± 6.5 mg.

A.P. alone and A.P. + formed elements = 58.6 ± 6.3 mg.

A.P. + plasma and A.P. + formed elements = 51.6 ± 7.6 mg.

*Average ovarian weights are based on 3 rats in every case except in the tests of sample 832C in which 2 rats were used.

The difference (51.6 ± 7.6 mg.) in the mean ovarian weights of test rats which received plasma and those which received formed

¹ Evans, H. M., Simpson, M. E., and Austin, P. R., *J. Exp. Med.*, 1933, **58**, 561.

² Casida, L. E., *J. Dairy Science*, 1935, **18**, 430.

³ Fevold, H. L., Hisaw, F. L., Hellbaum, A., and Hertz, R., *Am. J. Physiol.*, 1933, **104**, 710.

elements is highly significant. The data leave little doubt that the augmentive power of these blood samples was much greater from the formed elements than from the plasma. The mean ovarian weight of the rats which received plasma in addition to the pituitary extracts was not significantly greater than that of those which received pituitary alone (mean difference 7.0 ± 6.5 mg.). In only one case (FMA) did the plasma show definite indication of an augmentive quality.

Earlier studies² had indicated that the augmentive properties of blood serum were not destroyed by boiling. Because of this degree of heat stability tests were made to determine if the "augmenter" were organic or inorganic in nature. The formed elements were incinerated and tested as above at a dosage of 1.67 cc. blood equivalent. Two samples were tested, each on 3 rats. The average ovarian weights of those rats which received incinerated formed elements in addition to pituitary extract were 14 and 37 mg., whereas for the control groups on pituitary alone, they were 30 and 36 mg. The incinerated elements, therefore, did not show evidence of augmentive ability.

Conclusions. The ovary-stimulating effect of certain pituitary preparations is augmented by the blood of cattle; division of the blood into formed elements and plasma shows that the greater part of the augmentive action is attributable to the formed elements. Further, this activity is due to an organic rather than an inorganic substance.

8454 C

Studies in Hodgkin's Disease. II. Unsuccessful Experiments to Transmit Hodgkin's Disease to Dogs by Intralymphatic Injection.

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The transmission of Hodgkin's disease to animals has so far failed and auto-transplantation in man has also failed. Direct injection of Hodgkin's tissue into the lymphatics has not been tried. This method, applied to dogs, seemed of promise as Hodgkin's disease has been described in dogs.¹

¹ MacMahon, H. E., *Am. J. Path.*, 1934, **10**, 309.