and maintained this high rate of blood formation for weeks. Upon a casein diet the rate of blood regeneration was found to be no higher than upon the gluten diet. Feeding red corpuscles to the extent of 15% of the diet failed to increase the rate of blood formation over that of a control period.

The relations of vitamin A, B, and E to hemoglobin regeneration were studied, using the severe anemia type of experiment. It was found that rats in a marked state of avitaminosis due to the long continued absence of vitamins A, B, or E in the diets could regenerate their blood at the normal rate. Furthermore, the addition of vitamins A, B and E to diets deficient in these substances failed to produce any effect upon the rate of blood regeneration.

Conclusions: 1. Wheat gluten is an adequate dietary protein for promoting hemoglobin synthesis in the rat. Casein is not superior to wheat gluten for this purpose. 2. Hemoglobin and tryptophane in the diet are no better utilized than gluten for hemoglobin production in the rat. 3. The blood forming process in the rat is not dependent upon the presence of vitamins A, B, or E in the diet.

[1] Whipple, G. H., *Am. J. Physiol.*, 1925, lxxii, 395.

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Rate of Liberation of Tryptophane from Proteins by Enzymes.

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Casein, edestin, Witte peptone and squash seed globulin were subjected to trypsin hydrolysis. At different intervals of time a portion of the respective hydrolysates was taken and tryptophane determined by the indirect Vanillin-HCl reaction.[1] At the end of one hour three-fourths of the total available tryptophane in casein was liberated, a little less than one-half was liberated from edestin and two-fifths from squash seed globulin. Witte peptone had one-third of the total tryptophane available before incubation with trypsin and at the end of the first hour two-thirds was available. Equilibrium was established in the case of Witte peptone in 24 hours, casein in 72-96 hours, edestin and squash seed globulin in 120 hours. The latter 3 proteins were subjected to the action of pepsin, trypsin and erepsin in the order given and aliquot portions were taken and analyzed for amino nitrogen and for tryptophane.

At the end of the pepsin period of 96 hours there was an average of 17% amino nitrogen but no tryptophane liberated. During the trypsin period the liberation of tryptophane and the establishment of equilibrium was the same as in the experiment with trypsin alone without any pepsin action. Erepsin action for 48 hours showed an additional liberation of 15-18% of amino nitrogen but no change in the tryptophane concentration. Thus, trypsin or a trypsin type of enzymes alone are involved in the liberation of tryptophane from the proteins studied.

The effects of sodium and chloride ions on the precipitation of tryptophane by mercuric sulfate were studied. A 0.3% concentration of chloride ion interferes with and a 0.77% entirely prevents the precipitation of tryptophane under the conditions as given in the indirect Vanillin-HCl reaction. Sodium in concentrations up to 2% has no effect.

[1] Kraus, Ida, *J. Biol Chem.*, 1925, lxiii, 157.

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Demonstration of Rapid Pepsin-Hydrochloric Proteolysis in Vitro.

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Hydrolysis of the more complex protein molecule into simpler forms carried on with the aid of proteolytic enzymes ordinarily requires considerable time even at body temperature. Some time ago it was observed that the addition of a very small amount of solid pepsin to fibrin jelly causes an almost immediate solution of the fibrin at room temperature. The jelly was produced by treating 20 gm. of washed fibrin with 250 cc. of .04% hydrochloric acid. If the jelly is stirred or shaken after the addition of the pepsin, 5 minutes usually suffices to put the fibrin into solution. An observation on this point is recorded in literature but no definite data is given as to condition of the experiment, the speed of the solution or the nature of the end products.

Recently the nature of the soluble protein products has been studied. Dr. Hektoen determined by means of an anti-fibrinogen serum that the soluble protein, resulting from this treatment, was immunologically different from fibrinogen. This result definitely