

is collected in the gauze, thoroughly washed with water and is finally allowed to remain in water over night. It is then filtered on a Buchner funnel, spread in a thin layer on pans and allowed to dry at room temperature. Before it becomes thoroughly dry, there is a point at which it can be easily rubbed through a fine sieve whereby a uniform product is obtained. After being thoroughly dried in the air, it is ground to powder in a mill. Such preparations contain approximately 16.2% of nitrogen, ash- and moisture-free, and have been used with success in experiments to demonstrate the peculiar nutritive deficiencies of this protein.

Summary. Methods are described for the preparation of gliadin from wheat and of zein from corn (maize). The products are of a grade suitable for many types of nutrition investigations.

9013 P

Blood Chemistry of the Chick Embryo During Ontogenesis.

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Within the last few years increasing attention has been given to studies concerning the changes in the concentration of a number of blood constituents during prenatal development. With the aid of such data it may be possible to add further information concerning the utilization of the various foodstuffs during the embryonic period. Further, it may be possible, by correlating the extent of functional development of the various organs of the embryo at a given age with such chemical blood data, to throw further light upon the influence of a given organ upon intermediary metabolism.

The chick embryo was chosen as the experimental animal. The eggs were incubated under standard conditions and at the desired age the egg was carefully opened and sufficient blood for analysis was withdrawn from the vitelline artery or vein into a 1 cc. tuberculin syringe. Since satisfactory blood samples could not be obtained from embryos of less than 9 days incubation no analyses were attempted until that time. From this period on, however, the analyses were carried on through the entire incubation period and for several days after hatching.

TABLE I.
The Changes in the Blood Chemistry of the Chick Embryo During Ontogenesis. Average values. No. of embryos and determinations in parentheses.

Days from Beginning of Incubation	9	10	11	12	13	14	15	16	17	18	19	20	21*	22*	23*	24*	29*
Blood Sugar mg./100 cc.	143 (4)	126 (4)	143 (4)	143 (5)	131 (7)	137 (6)	133 (4)	158 (4)	157 (6)	161 (7)	158 (3)	170 (2)	182 (3)	229 (2)	206 (1)	246 (2)	
Uric Acid mg./100 cc.	1.34 (2)	1.59 (2)	1.72 (2)	1.83 (2)	1.62 (5)	1.87 (2)	2.39 (3)	2.35 (2)	2.20 (4)	2.13 (3)	2.66 (3)	2.71 (5)	2.94 (6)	5.01 (4)	4.34 (1)	7.22 (1)	4.95 (2)
Cholesterol mg./100 cc.	98 (2)	156 (2)	164 (2)	175 (1)	173 (4)	192 (3)	296 (4)	274 (2)	360 (3)	364 (3)	313 (3)	207 (2)	172 (4)	241 (5)		249 (4)	
Hemoglobin gm./100 cc.	6.6 (4)	6.3 (4)	6.5 (2)	9.3 (4)	10.1 (6)	12.7 (3)	14.1 (2)	14.0 (3)	13.1 (6)	13.2 (3)	11.2 (9)	11.4 (6)	12.2 (7)	10.9 (2)	10.6 (1)	9.9 (7)	9.8 (2)
Red Blood Cells million/cmm.	0.95 (2)	0.73 (2)	1.06 (2)	1.11 (2)	1.33 (4)	1.66 (2)	1.79 (3)	1.88 (2)	2.20 (1)	2.15 (2)	1.89 (3)	1.96 (4)	2.08 (2)	2.61 (2)	2.00 (2)	2.35 (3)	1.80 (1)

*Hatched chicks were used on these days.

Table I presents the results of the average daily changes occurring in the several constituents of the blood during the course of ontogenetic development. The numbers in parentheses indicate the number of separate analyses from different embryos used to compute the average. From these results it is observed that the embryonic blood sugar is increased beginning with the 16th day of incubation. The increase in the uric acid concentration is observed much earlier in the developmental period. Similar increases are observed in the concentration of cholesterol and hemoglobin, and in red blood cell counts, with the exception of a definitely lowered level during the hatching period.

Further studies are in progress to determine more exactly the extent and significance of these changes.

9014 P

Availability of Iron in Wheat.

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Elvehjem, Hart, and Sherman¹ have reported that the inorganic iron content of wheat is approximately 47% of the total iron content. Their biological studies indicated that this figure also represents the available iron content. On the contrary Rose, Vahlteich, and MacLeod² observed that wheat is an excellent source of iron for hemoglobin formation.

In order to determine whether there is any great variation in the form of iron in different varieties of wheat, 11 samples representing both hard spring wheat and soft winter wheat were analyzed for total and inorganic iron. A modification of the technic of Elvehjem, Hart, and Sherman,¹ which employs a longer extraction period, was used to determine the inorganic iron, whereas the total iron was determined on ashed samples by the thioglycolic acid method.³ The total iron of the 11 samples ranged from 2.90 mg. to 4.87 mg. of iron per 100 gm. of wheat. The inorganic iron showed

¹ Elvehjem, C. A., Hart, E. B., and Sherman, W. C., *J. Biol. Chem.*, 1933, **103**, 61.

² Rose, M. S., Vahlteich, E. M., and MacLeod, G., *J. Biol. Chem.*, 1934, **104**, 217.

³ Hanzal, R. F., *PROC. SOC. EXP. BIOL. AND MED.*, 1933, **30**, 846.