

which stand up under this 24 hour test at 37.5° C. would be entirely satisfactory for distribution in Schick outfits.

Similar experiments have been undertaken with several of our toxins and toxins from 7 other laboratories in order to ascertain if the diluent is adapted to a sufficiently large number of toxins to warrant adopting the routine dispensing of toxin ready-diluted for Schick tests. The results of these experiments will be published in full later.

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Concentration of Amino-Acids, Urea, and Total Non-Protein Nitrogen in Foetal and Maternal Blood of Rabbit During Pregnancy.

FRANKLIN F. SNYDER* AND F. MEREDITH HOSKINS.

From the Department of Anatomy, University of Rochester Medical School.

It has long been recognized that there are histological changes in the placenta at various stages of pregnancy. There has been little investigation, however, of the possibility that these morphological alterations are linked with coincident changes in the concentration of various metabolites, such as glucose, urea and amino-acids in the blood which bathes the foetal and maternal surfaces of the placental boundary. In recent observations, however, it has been found that the concentration of blood sugar¹ and hemoglobin² is strikingly different on the foetal and maternal sides of the placental barrier in the rabbit at the beginning of the last third of the gestation period; on the other hand, at term, the blood sugar and hemoglobin are found to approach much more nearly an equal concentration in the foetal and maternal blood. It is obvious that data derived from observations at term may fail to give a complete understanding of the regulatory activity of the placenta. If the previous observations in the human are viewed in this light, as for instance, the careful description by Plass³ of the concentration of urea, amino-acids, and total non-protein nitrogen in foetal and maternal blood at parturition, and the studies of Slemmons,⁴ it is evident that the data are limited to observations at a single stage of pregnancy.

* Department of Obstetrics, The Johns Hopkins University.

¹ Snyder, F. F., and Hoskins, F. M., *Anat. Rec.*, 1928, xxxviii, 28.

² Zeidberg, L. D., unpublished observations from this laboratory.

³ Plass, E. D., *Johns Hopkins Hosp. Bull.*, 1925, xxxvi, 393.

⁴ Slemmons, J. M., 1919, "The Nutrition of the Foetus."

In the present experiments, a series of 24 rabbits has been observed at various stages of pregnancy from the 26th day until near term, *i. e.*, the 32nd day. As summarized in the table, it has been found that the urea nitrogen is present in about equal concentration in the foetal and maternal blood; on the contrary, the amino-acid nitrogen and the total non-protein nitrogen are found consistently in greater concentration in foetal than in maternal blood.

TABLE I.

The Concentration of Amino-acid Nitrogen, Urea Nitrogen, and Total Non-protein Nitrogen of the Foetal and Maternal Blood at Various Stages of Pregnancy.

Day of Preg- nancy	Diet	Amino-acid N (mgm. %)		Urea N (mgm. %)		Total NPN (mgm. %)	
		Maternal	Foetal	Maternal	Foetal	Maternal	Foetal
26	Well fed	8.6	9.7	12.4	11.6	26.7	42.2
26	" "	8.6	13.7	17.9	18.5	34.3	49.8
26	Fasted 25 hrs.	—	—	19.7	19.2	41.2	43.3
27	Well fed	7.6	12.1	23.5	24.0	35.4	51.0
27	" "	8.7	11.4	13.5	13.5	33.3	44.5
27	" "	—	—	18.3	19.8	38.5	45.0
27	Fasted 24 hrs.	7.5	10.6	—	—	—	—
27	" 26 "	—	—	23.4	20.8	43.5	—
27	" 30 "	—	—	17.4	14.0	—	—
27½	Well fed	—	—	11.5	12.9	33.9	47.1
28	" "	9.1	10.5	—	—	—	—
29	Fasted 140 hrs.	8.5	11.3	24.3	26.2	44.7	56.1
30	" 72 "	7.8	11.5	34.4	26.3	60.0	76.0
30	" 72 "	7.1	10.8	44.0	45.9	97.5	108.5
30	" 23 "	7.5	11.0	—	—	—	—
31	Well fed	8.1	11.8	12.2	10.0	32.4	43.0
31	" "	8.0	13.7	26.0	25.7	52.4	62.1
31	" "	7.9	12.6	32.7	32.9	45.4	62.6
31	" "	7.8	9.6	26.3	29.9	51.4	55.8
31	Fasted 16 hrs.	—	—	15.6	15.8	—	—
31	" 36 "	—	—	20.7	18.8	40.5	50.4
31	" 46 "	8.8	12.2	50.7	49.4	70.9	82.8
31	" 48 "	—	—	20.9	16.5	—	—
31	" 70 "	10.0	11.6	66.1	60.2	97.4	127.4

The determinations were made on whole blood in duplicate samples, according to the methods given by Folin.⁵ The animals were sacrificed by a blow on the head, and the foetuses were rapidly bled from the jugulars. Filtrates obtained from the blood of all the foetuses of a litter were usually combined.

⁵ Folin, O., *Lab. Man. Biol. Chem.*, 1923, 235, 239, 263.