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## Individual Variation in Fasting Blood Sugar.

G. WALTERMANN HOLT AND ESTHER M. GREISHEIMER.

*From the Department of Physiology, The University of Minnesota.*

The individual variation in fasting blood sugar was investigated in 4 healthy adults (2 women and 2 men), on successive days over a period of 3 weeks. The subjects were permitted to eat their usual diets. After a 12-hour fast, the blood was drawn by venepuncture.

Protein removal was effected, in the freshly drawn sample, by the Somogyi<sup>1</sup> zinc precipitation method. The glucose content of the filtrate was determined by the improved copper-iodometric titration of Shaffer.<sup>2</sup> All determinations were made in duplicate.

The data for each individual and for the group as a whole were analyzed statistically. The means, with the minimal and maximal values, standard deviations, and coefficients of variation, are presented in Table I.

TABLE I.  
*Variation in fasting blood sugar in mgm. %.*

Subject	Days	Mean	Minimum Maximum	Standard Deviation	Coefficient of variation
1.	20	93.37±0.97	73.2—104.4	6.41±0.68	6.87
2.	20	86.18±0.52	80.4— 93.0	3.46±0.37	4.02
3.	21	88.73±0.86	76.7— 97.9	5.84±0.61	6.58
4.	15	84.00±0.56	76.7— 88.6	3.24±0.40	3.86
Group		88.35±0.47	73.2—104.4	6.04±0.33	6.84

The mean value is lower than that found by other methods, since it represents only the true glucose. The mean value found for the group of 42 individuals in the glucose tolerance study<sup>2</sup> was 83.12±0.56 mgm. %.

The minimum and maximum values show a spread of 31.2, 12.6, 21.2, and 11.9 mg., for subjects 1, 2, 3, and 4, respectively. Since no attempt was made to keep the diet uniform for the 4 individuals, nor in the same individual from day to day, such differences were anticipated. The standard deviation for any subject does not differ significantly from that previously found in the earlier group of 42.<sup>2</sup> The latter was 5.38±0.40.

<sup>1</sup> Somogyi, M., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, **26**, 353.

<sup>2</sup> Holt, G. W., and Greisheimer, Esther M., *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **28**, 547.

The coefficients of variation compare favorably with that in the previous study, which was 6.5.

The authors conclude that the fasting blood sugar in any normal individual varies from day to day as much as it does in a large group of normal individuals taken at random.

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#### Peripheral and Central Chemical Control of Pulmonary Ventilation.

HARRIET OWEN AND ROBERT GESELL.

*From the Department of Physiology, University of Michigan.*

Until the recent work of Heymans there has been little evidence for reflex chemical control of pulmonary ventilation. The demonstration of increased respiratory movements from perfusion of the carotid sinus with carbonated and deoxygenated blood calls for a study of the relative values of peripheral and central chemical control.<sup>1</sup> Several procedures were used.

The effects of injection of sodium cyanide, sodium sulphide, sodium carbonate and sodium bicarbonate into the carotid arteries after occlusion of the vertebral and external carotid arteries and denervation of one carotid sinus were noted. Injection of sodium cyanide on the side on which the innervation of the carotid sinus was intact invariably produced increased ventilation. Injection on the denervated side produced relatively small or no increase in ventilation followed by depression. In general the effects of intra-arterial injection of sodium sulphide were similar to those produced by cyanide. Painting the innervated sinus with sodium cyanide or sulphide elicited increased ventilation. This response was demonstrated to be due to local action. Intravenous injection of sodium cyanide or sulphide after double vagotomy and double sinus denervation was relatively ineffective or entirely ineffective in augmenting ventilation. Late depression of ventilation was not uncommon. Similar results were obtained if the common carotid arteries and the internal occipital arteries were occluded as a substitute for denervation. Injection of cyanide into the 4th ventricle was found to produce immediate excitation or depression without initial excita-

<sup>1</sup> Bouckaert, Dautrebande and Heymans, *J. Physiol.*, 1931, **71**, 5.