

Fasting Blood Carotene Level in Normal and Diabetic Individuals.

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In the course of a study on the effect of the oral administration of carotene on the blood carotene of normal and diabetic individuals, we investigated the fasting blood carotene level in these 2 groups. The number of figures available on this subject are still somewhat limited, and are mostly single observations taken at random.^{1, 2, 3} Rabinowitch⁴ in a study of carotinemia in diabetes does not report the figures for blood carotene as mg. % but in units, so that the actual figures are difficult to compare with those of other observers.

The diabetic patients studied were on a known diet of carbohydrate, protein and fat. The normals were on a mixed diet from which carrots were omitted, as was the case in the diabetic diets. Fasting bloods were taken. The serum carotene was estimated by the method of White and Gordon² and is reported in mg. %. Blood cholesterol were done by the Bloor colorimetric method.⁵ Nine normals were observed (Table I) and 19 diabetics (Table II). At least 3 determinations were done on each patient. In all, 35 observations were made on normals and 83 on diabetics. The results on the normals analyzed according to Dunn⁶ show the average fasting normal

TABLE I.
Average Blood Carotene and Cholesterol in Normals.

Age	Sex	Average		Upper Limit		Lower Limit	
		Carotene mg. %	Chol. mg. %	Carotene mg. %	Chol. mg. %	Carotene mg. %	Chol. mg. %
50	M	.122	158.	.122	172.	.122	148.
45	M	.077	176.	.081	192.	.068	164.
48	M	.122	190.	.122	217.	.122	176.
44	M	.108	163.	.108	227.	.108	145.
22	M	.136	172.	.122	179.	.095	167.
34	M	.054	165.	.054	180.	.054	152.
22	M	.113	176.	.135	208.	.108	156.
26	M	.148	172.	.162	192.	.122	161.
22	M	.153	161.	.176	217.	.122	122.

¹ Connor, C. L., *J. Biol. Chem.*, 1928, **77**, 619.² White, F. D., and Gordon, E. M., *J. Lab. and Clin. Med.*, 1931-32, **17**, 53.³ Stoner, W. C., *Am. J. Med. Sc.*, 1928, **175**, 32.⁴ Rabinowitch, I. M., *Arch. Int. Med.*, 1930, **45**, 586.⁵ Bloor, W. R., Pelkan, J. F., and Allen, D. M., *J. Biol. Chem.*, 1922, **52**, 191.

TABLE II.
Average Blood Carotene and Cholesterols in Diabetes

Age	Sex	Aver.		Upper Limit		Lower Limit		Diet			
		Carotene mg. %	Chol. mg. %	Carotene mg. %	Chol. mg. %	Carotene mg. %	Chol. mg. %	Carb. gm.	Pro. gm.	Fat gm.	Daily Insulin Units
47	M	.318	272.	.338	308.	.284	232.	250	65	85	30
45	M	.216	204.	.230	223.	.203	194.	200	75	85	30
48	M	.337	211.	.351	229.	.311	194.	250	75	85	75
40	M	.207	241.	.216	250.	.203	227.	180	65	85	15
65	M	.337	251.	.378	294.	.257	222.	180	75	85	none
49	M	.277	178.	.324	225.	.230	156.	220	65	85	8
30	F	.212	214.	.230	227.	.203	200.	200	70	83	50
34	F	.131	189.	.149	217.	.108	161.	280	73	83	15
18	M	.220	218.	.230	263.	.216	176.	200	65	85	60
64	F	.135	250.	.162	296.	.108	200.	220	63	83	8
62	F	.090	217.	.094	253.	.081	194.	150	63	70	none
61	F	.205	302.	.256	378.	.136	264.	200	63	85	''
30	M	.284	235.	.337	312.	.216	200.	160	60	90	28
63	M	.346	196.	.378	221.	.294	181.	165	62	108	none
66	F	.302	323.	.351	347.	.243	301.	150	52	62	''
60	M	.176	166.	.203	222.	.148	143.	200	60	87	22
53	M	.144	222.	.162	248.	.108	208.	142	60	90	none
49	F	.482	269.	.750	329.	.335	219.	174	63	83	12
22	M	.284	290.	.297	306.	.270	258.	245	65	85	40

serum carotene to be 0.109 mg. % with a standard deviation of ± 0.104 . The limits then would be 0.213 mg. % and 0.005 mg. %. All of our observations fell within these limits so that the figures may be considered significant. In the diabetics the average fasting serum carotene was 0.262 mg. % with a standard deviation of $\pm .112$. The limits are then 0.374 and 0.150 mg. %. Seventy-four percent of the figures fall within the average \pm the standard deviation. Ninety-five percent fall within twice and 99% within 3 times the standard deviation.

It is clear from these observations that the fasting blood carotene is higher in diabetics than in normals. The average of the diabetics being 0.262 mg. % as compared to 0.109 mg. % for the normals. The average cholesterol in the normals was 178 mg. % as compared to 233 mg. % in the diabetics.

⁶ Dunn, H. L., *Physiol. Rev.*, 1929, **19**, 275.