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Effect of Feeding of "Soya Lecithin"* on Serum Cholesterol Level of Man.

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In a previous report[1] it was postulated that the hypercholesterolemia resulting from the feeding of egg yolk powder, which is rich in cholesterol and lecithin, was due partially to its lecithin content. It was therefore considered of interest to determine the effect of feeding "soya lecithin" on the serum cholesterol level of 8 human subjects.

Method. Twenty-five grams of "soya lecithin"* were fed daily to 7 patients for 6-week periods and to one patient (No. 5) for a 10-week period. The "soya lecithin" was fed in 5 g portions spread between two crackers. The diagnosis in 6 of the 8 patients was coronary arteriosclerosis, made on the basis of clinical symptoms, signs and electrocardiographic changes. Five of the 6 individuals had previously experienced a myocardial infarction. The remaining 2 patients had classical rheumatoid arthritis, the diagnosis of which was confirmed by roentgenographic change. No untoward symptoms or signs occurred during the "soya lecithin" feeding periods. Serum cholesterol determinations by the method of Bloor, Pelkan, and Allen[2] were made twice weekly during an initial 4-week control period, the 6-week "soya lecithin" feeding period and a subsequent 4-week control period. Throughout these observations, the patients were fed a standard hospital diet. This was not rigidly controlled. It contained approximately 90 g of protein, 100 g of fat, and 340 g of carbohydrate, with a caloric equivalent of 2600 calories. Four of the patients were fed "soya lecithin" for a second test period of 6 weeks. Basal metabolic rates were determined during the control period, and in the 4th and 5th week of the "soya lecithin" feeding period.

Results. The results of feeding "soya lecithin" on the serum cholesterol level are contained in Table I. There were 12 feeding periods in 8 patients. It can be seen that the serum cholesterol level declined during each period of "soya lecithin" feeding. The extent of the fall from the average of control period determinations varied from 44 to 144 mg/100 cc. Fig. 1 demonstrates, in one instance, the lowering effect of "soya lecithin" on the serum cholesterol level. The serum cholesterol, however, returned to the control levels, in each instance, after 4 to 5 weeks, even though the "soya lecithin" feeding was continued. After further control observations, 4 of the patients were fed "soya lecithin" during a second period. The results obtained were similar to those in the initial experiment. Basal metabolic rates remained approximately the same during the control period and the period of maximum depression of the serum cholesterol level.

Discussion. From the above it is evident that the feeding of "soya lecithin" to human subjects results in a lowering of the serum cholesterol level. Corwin[3] has reported that a hypercholesterolemia was produced in dogs by the feeding of lecithin derived from the adrenal gland. However, Kesten and Silbowitz[4] have stated that the feeding of "soya lecithin" inhibits the hypercholesterolemia of rabbits fed a diet rich in cholesterol. The effect of "soya lecithin" and that of lecithin obtained from the adrenal gland on serum cholesterol level are apparently different. It should be emphasized that "soya lecithin" is

1 Steiner, A., and Domanski, B. N., *Am. J. Med. Sc.*, 1941, **201**, 820.

* American Lecithin Co., Elmhurst, L.I. Approximate composition, lecithin 20%, cephalin 20%, oil 30%, phytosterols 2%, inositol and allied compounds 15%, carbohydrates 10%.

2 Bloor, W. R., Pelkan, K. F., and Allen, D. M., *J. Biol. Chem.*, 1922, **52**, 191.

3 Corwin, W. C., *Arch. Path.*, 1938, **26**, 426.

4 Kesten, H. D., and Silbowitz, R., PROC. SOC. EXP. BIOL. AND MED., 1942, **49**, 71.

TABLE I.
Effect of Soya Lecithin Feeding on Serum Cholesterol Level of 8 Patients.
Serum cholesterol expressed as mg/100 cc.

Patient No.	Initial control period (4 wks) Range	Avg	Soya lecithin period (6 wks) Lowest value	Ext. of decline	2nd control period (4 wks) Range	Avg
1	329-378	349	290	59	309-357	340
2	537-561	546	402	144	458-536	496
3	458-505	474	388	86	442-462	456
4a	320-386	348	275	73	315-345	328
b	345-380	365	302	63	371-400	384
†5a	242-252	245	192	53	238-258	245
b	239-256	245	195	50	236-256	242
*6a	226-240	235	190	45	215-245	235
b	240-252	245	201	44	253-275	262
*7	232-238	235	180	45	220-238	232
8a	416-424	420	344	84	395-426	410
b	390-420	410	335	75	416-449	430
				Avg 68		

* Patients with rheumatoid arthritis.
a = First experimental period.
b = Second " "
† Lecithin feeding period—10 weeks.

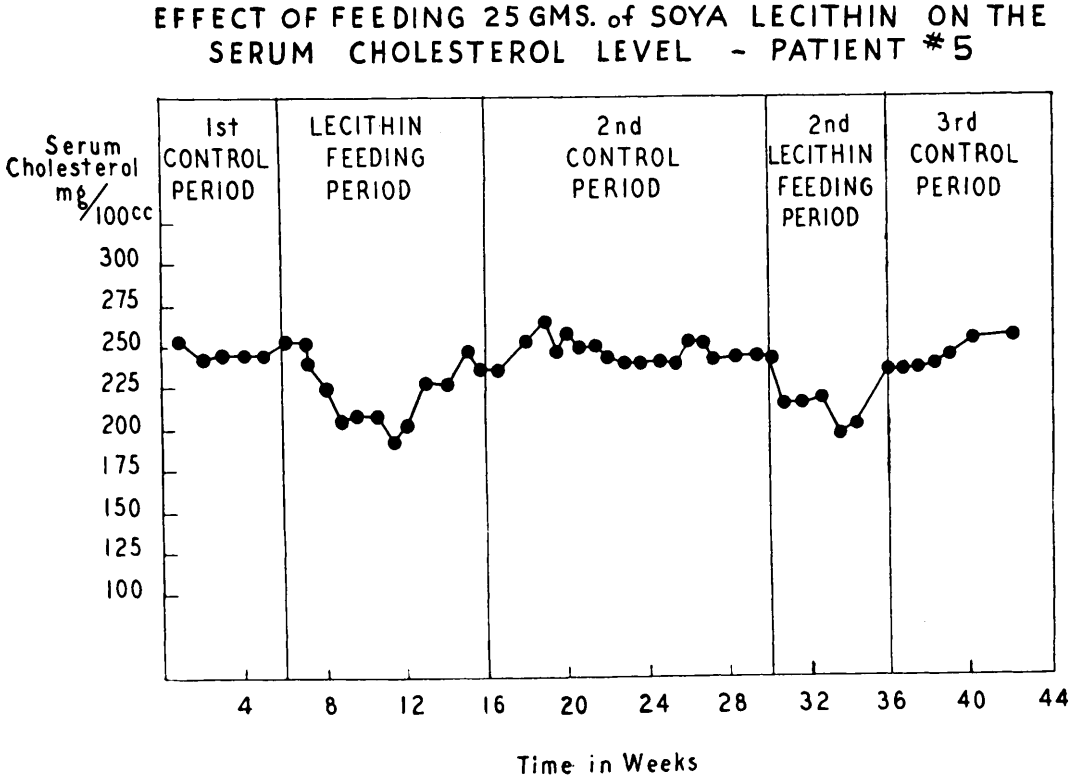

FIG. 1.

composed not only of lecithin, but also of cephalin, oil, phytosterol, inositol, and carbohydrates as well.

The inference that the hypercholesterolemia resulting from the feeding of egg yolk powder was partially due to its lecithin content[1] is not supported by these experiments. On the contrary, "soya lecithin" has been found to lower the serum cholesterol level not only in people on a normal diet but also in rabbits on a high cholesterol regime.[4]

Since this article was prepared Gross and Kesten[5] have reported that the feeding of "soya lecithin" was effective in reducing the hypercholesterolemia in all of 3 patients. The diagnosis in 2 of these individuals was xanthomatosis. Necrobiosis lipoidica diabeticorum was the stated diagnosis in the third patient. Adlersberg and Sobotka[6] have also shown that the elevated serum cholesterol of 5 patients with xanthomatosis was lowered by "soya lecithin" feeding.

Summary. (1) Twenty-five grams of "soya lecithin" were fed to 8 patients for 6-week periods. (2) The serum cholesterol level in each instance was lowered significantly. The decline was maintained for only 5 weeks despite the maintenance of the "soya lecithin" regime. (3) The induced hypocholesterolemia was not associated with an increase in the basal metabolism.

5 Gross, P., and Kesten, B., *Arch. Derm. and Syph.*, 1943, **47**, 159.

6 Adlersberg, D., and Sobotka, H., *J. Mt. Sinai Hosp.*, 1943, **9**, 955.

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Effect of Adrenotropic Hormone on Ascorbic Acid and Cholesterol Content of the Adrenal.*

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In a previous report (Sayers, Sayers, White, and Long[1]) it was shown that a single dose of pure adrenotropic hormone markedly depletes the cholesterol content of the adrenal to about 50% of its normal value in the space of 3 hours. The alterations in the ascorbic acid content of the adrenal that follows the administration of adrenotropic hormone have now been determined.

The animals used were 24-day-old male rats of the Yale strain. They were obtained from the Biochemical Laboratory of the Connecticut Agricultural Experiment Station through the courtesy of Dr. Rebecca Hubbell. Pure adrenotropic hormone was prepared according to the method of Sayers, White and Long.[2] The hormone was injected intraperitoneally as an aqueous solution in a volume of 0.5 ml. At the end of the experimental period the animals were anesthetized with nembutal, the adrenals removed and weighed to the nearest 0.1 mg on a torsion balance. The ascorbic acid content of the adrenals was determined by the method of Bessey[3] and the cholesterol content by the method of Schoenheimer and Sperry as described by Sperry.[4]

The changes which take place in the ascorbic acid and cholesterol content of the adrenals following the injection of a single dose of pure

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1 Sayers, G., Sayers, M. A., White, A., and Long, C. N. H., PROC. SOC. EXP. BIOL. AND MED., 1943, **52**, 200.

2 Sayers, G., White, A., and Long, C. N. H., *J. Biol. Chem.*, 1943, **149**, 425.

3 Bessey, O. A., *J. Biol. Chem.*, 1938, **126**, 771.

4 Sperry, W. M., *Am. J. Clin. Path., Tech. Suppl.*, 1938, **2**, 91.