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Source of Increase in Serum Calcium Induced by Irradiated Ergosterol.

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We have shown that irradiated ergosterol is able not only to raise the level of the inorganic phosphorus and calcium of the blood, when it is decreased in rickets and in tetany, but that it brings about hypercalcemia when given to normal infants or animals.¹ The question naturally suggests itself as to whether this calcium is taken from the bones and other tissues, or is the result of increased absorption from the intestine. In order to investigate this point, rats were placed on a diet almost free of calcium and high in phosphorus, for a period of 3 days, in other words, until there was no longer any calcium within the intestinal tract. It was found that this procedure greatly reduced the calcium content of the blood, that it fell from the normal of 10 to 6.4 mg. per 100 cc. of serum. In fact, it reached about this level within 24 hours. This calcium depletion of the blood could, however, be brought about only in young animals weighing 100 gm. or less and did not develop in the adult rat. It may be added that the low calcium concentration tended to right itself and to reach the normal plane in the course of succeeding weeks.

When large amounts of irradiated ergosterol (1 mg. daily) were fed to young rats that had been prepared in this way, it was found that without exception the calcium could rapidly be increased 50% or more. This took place although the animals received approximately only 0.8 mg. Ca and 400 mg. P a day, which is a Ca:P ratio of 1:500. A series of experiments showed that the comparatively high amount of phosphorus in this ration played an important rôle, markedly interfering with the absorption of calcium. These results indicate that when the diet contains almost no calcium, the calcium which is supplied to the blood on giving irradiated ergosterol is derived from the tissues. Similar tests are being carried out with animals receiving an adequate amount of calcium.

¹ Hess, A. F., Lewis, J. M., and Rivkin, H., *J. Am. Med. Assn.*, 1928, xci, 783.