



VITAMIN NEWS



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VITAMIN "D"

The physiological action of Vitamin D is to increase the ability of the blood serum (and lymph) to carry diffusible calcium. This means that dietary calcium is better absorbed, and calcium reserves loosely held in certain tissues (metaphyses of bone) will be absorbed in some degree, while more calcium is thereby made available for tissues having a greater affinity for it. The shafts of the long bones grow under these circumstances at the expense of the metaphyseal calcium.

The kidneys excrete calcium as soon as the serum content rises above a certain threshold point, and the administration of excessive doses of Vitamin D can cause nephritis and nephrosis from this overactivity.

The ovaries secrete a hormone that causes (in pregnancy) a great increase of the affinity of the cells in the "storage areas" for calcium, thereby lowering the serum content below the threshold point so that none is eliminated, and the calcium reserves become greatly built up during the first few months, with a temporary increase in the thickness of the bone walls, and a greatly increased need for Vitamin D to aid in the absorption, and an increased need for Vitamin C to supply the connective tissue matrix for the osseous deposits.

Vitamin C is also highly important to the child in the same connection. It is now recognized that Vitamin C rather than Vitamin D deficiency is responsible for defective tooth development through the incomplete formation of the connective tissue matrix. It is probable that this connective tissue matrix can only be formed when Vitamin C is present, and this is particularly true of teeth. In Vitamin C deficiency, this matrix tends to dissolve, with elimination of calcium. This effect is a part of the general degeneration of connective tissue characteristic of scurvy. Pyorrhea and caries will disappear when Vitamin C becomes recognized as the specific preventive and remedy for these conditions. (See Sherman-Smith "The Vitamins" pages 161-168). The use of Vitamin D has been overrated for these conditions, it being the minor factor. In scurvy the bones become decalcified, particularly the parts last to ossify, and the joints become swollen and sore.

Oversecretion of the ovarian calcium-depressing hormone is responsible for the nervous, irritable and hysteretic type of woman, because of the nervous irritability occasioned by the low serum calcium. Vitamin therapy is particularly successful in normalizing this type, and the use of "Catalyn" is indicated. Vitamins C, D and F are all factors. This type usually has a prematurely aged appearance, and the effect of vitamin therapy is often an obvious rejuvenation.

There is a vitamin principle present in oatmeal that is antagonistic in action to Vitamin D, its effect on serum calcium being somewhat similar to the ovarian

hormone in this respect. The use of oatmeal water as a preventive of toxic effects from too much sunlight (such effects being chiefly due to the formation of excessive amounts of Vitamin D in the skin with consequent immediate absorption) has long been a practice of persons working in the sun. Like the use of cod liver oil for rickets, long before vitamins were thought of, this practice is now known to have a scientific basis.

Some observers have made the statement that Vitamin D caused a reduction in serum calcium. Small doses can do this, by increasing the diffusibility of the calcium present in the blood serum, enabling its immediate escape into calcium-starved tissues. Certain of the glands supplying digestive fluids require considerable calcium, and these show one of the first indications of calcium increase when Vitamin D is administered. The parotid secretion normally contains three times the calcium of blood serum, and the rise in saliva calcium after Vitamin D administration is greater than the rise in serum calcium. It is an established fact that the calcium dissolved out of the tooth enamel surface by fruit acids, etc. is replaced from the salivary calcium.

Vitamin D has been charged with causing over-development of osseous structures. But more careful investigations have shown that cases of relative enlargement of diaphyses should be interpreted as caused by the healing of a condition of rickets. Where an ample supply of Vitamin D is always available, as in the tropics, the tendency is for bone development to be completed sooner, with consequent reduced stature.

Overdosage of Vitamin D is followed by toxic effects, characterized by damage to kidney parenchyma, and pathological calcium deposits in blood vessel walls, liver and kidney. The relation between the toxic dose and the therapeutic dose varies, and is dependent upon the nature of the diet as well as the body requirements for calcium. It has been found that there is no danger of toxic effects during pregnancy and lactation, in animal tests, even with doses that will be very harmful to the animal otherwise. The feeding of oatmeal increases the need for Vitamin D in test animals, and brings on rickets more quickly than other foods for the reason before noted. This antagonistic vitamin probably is also beneficial, however, and its use as a food should not be discouraged, rather it should be more used, but with care that Vitamin D is not forgotten. It is probable that disease can also result from the deficiency of the oatmeal vitamin, and it is no doubt just as essential to health as Vitamin D, which becomes toxic only when there is an absence of such cooperating principles.

To summarize, we can say that Vitamin D is an agent that enables the blood serum to pick up calcium, it increases the diffusibility of the serum calcium, increases the absorption of dietary calcium, and increases the amount of calcium available to tissues and organs that must have this element. There are other calcium-regulating principles, however, that control the affinity of these tissues and organs for calcium, upon which the utilization of calcium depends. Unless these are present, the effect of Vitamin D is to increase temporarily the serum calcium beyond the renal threshold point until the kidneys restore the normal balance, and this increase may be as much due to absorption from the bone reserves as from dietary sources.

Tablets of Vitamin D concentrate are now available from our distributors, and each tablet contains as much calcium as 12 ounces of milk. The price is the same as our other products - 36 tablets for \$1.50, 120 tablets for \$4.50; dosage 1 to 4 a day, but it must be kept in mind that due to the possibility of toxic effects the full dose must not be used except for short periods (a week or 10 days) or where there is an evident situation of avitaminosis. Otherwise, the greatest adult dose for a long period of time should not be over one tablet every other day. Children can use to advantage the same amount as the adult. In pregnancy, one or two a day, continuing through lactation, but not necessary if the full dose of "Catalyn" is being taken.