

THE DIRECT EFFECT OF MALNUTRITION ON TISSUE DEGENERATION

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Address to the Seattle Chapter
of the American Academy of Applied Nutrition
November 17, 1949

The most common lesion of tissue degeneration due to malnutrition is dental caries. A review of the literature twenty-six years ago revealed that dental caries occurred mainly in children whose endocrine system has been impaired by malnutrition. (1) (2)

But we still are at sea as to the exact deficiencies that cause this lesion. Since the effect of the deficiency is indirect, acting primarily on the endocrine glands, which in turn, by their unbalance, permit the carious processes to occur, this haziness of our knowledge is understandable.

Parts of the country appear to have a soil that produces food that immunizes the inhabitants to dental caries. One is Deaf Smith County, Texas. When the investigators of the State of Texas went to Hereford, the county seat of this county, to investigate the rumor of caries immunity, they had to examine 73 native born inhabitants before they found their first cavity. Grain and vegetables grown in Deaf Smith County soil were found to have a higher-than-average content of phosphorus and calcium. (3)

Flour from wheat grown on this soil was found to carry six times the calcium and phosphorus of average flour. The higher magnesium and fluorine content of the water and foods was considered a part of the cause of the immunity by Dr. Taylor in his discussion in the preceding reference. The high content of protein in the wheat was also remarked on.

This high protein might have a more direct influence than has been suspected. Tryptophane lowers blood sugar and reduces salivary acidity. Both these changes are favorable to immunity to caries. (4) Tryptophane is an amino acid found in cereal and meat proteins, but is destroyed by cooking, especially in the presence of sugar or glucose. (5) That explains another long standing mystery, why sugar and cooked foods were both inimical to dental health. Sugar alone in the blood is capable of unbalancing the calcium-phosphorus ratio, increasing the susceptibility to caries and other diseases that follow disturbances in calcium metabolism. (6)

The protein matrix of bones and teeth is an elastic tissue that contains a very special amino acid pattern high in tryptophane and lysine, lysine being another amino acid destroyed by cooking in the presence of sugar. It is evident that the cooking of food can be very important in contributing to tissue degeneration. The cooking of bone renders its minerals, as well as its amino acids, relatively useless nutritionally. Steamed bone meal has been found of little value in adding calcium to animal diets, and even the pasteurization of milk destroys

its calcium assimilability, precipitating most of it in the pasteurizing apparatus, where the milk industry calls it "milk stone," quite comparable to the precipitation of lime in a teakettle.

On the other hand, the use of vacuum-dehydrated raw fresh bone powder seems to rebuild bone and teeth with their supporting tissues quicker than any other food. The combination of the connective tissue and bone minerals in their natural state seems reasonable; the present loss as a waste by-product of such fine food materials is about as sensible as our degermination of cereals and feeding the discarded by-products to cattle. When a mouse in a corn crib dines off kernels of corn, he eats the germ only. When we buy any packaged cereal in a grocery store, corn meal or corn flakes, we buy what the mouse refused to eat. We get this non-nutritional food simply because we are as gullible as the allegorical New Englander who was taken in on wooden nutmegs. The difference is that we keep on buying the wooden nutmegs and try to make believe we are getting the genuine.

Collier's, of October 8, 1949, carried an article on the incredible conditions in the Allen County Home for the Indigent near Fort Wayne, Indiana, where the inmates have been dying off at a rapid rate--almost ten percent a month--of vitamin deficiency by reason of the county commissioners' attempt to feed them on 38 cents per person, per day.

An intelligent nutritionist could feed them with every needed vitamin in their diet for that figure, if necessary, but not on the noodles and potatoes with white bread served at this institution.

A great fuss is stirred up, as it should be, over this inhuman treatment of these victims of circumstances. A fuss ten thousand times bigger should be stirred up over the vitamin deficiency deaths from heart disease alone, that are constantly going on in this country, by reason of the general use of adulterated flour and cereal products.

The killing power of commercial white bread and whole wheat bread is well gauged in the table herewith, taken from Cereal Chemistry, May, 1948:*

Group fed	Percent weaned of their third litter
nonfat milk bread (6%)	54.8%
enriched nonfat milk bread (6%)	49.0%
enriched water bread	36.4%
water bread	21.1%
whole wheat nonfat milk bread (6%)	7.1%
whole wheat bread	NONE

Note that commercial whole wheat bread is the most fatal of all. This seems curious, until you realize that whole wheat has not had the minerals and vitamins

* Beaty, A., and Fairbanks, B.W. Cereal Chemistry. May, 1948.

removed by milling and refining processes, so it can only be preserved from insect infestation by adding poison bug killers. "Bleach" is the polite commercial term for this poison. Four times as much is required to protect whole wheat from bugs as is needed in white flour. REMEMBER BLEACH POISONS, OR ANY OTHER KIND, WERE DECISIVELY PROHIBITED BY THE U.S. SUPREME COURT IN 1918. The criminal arrogance of the flour adulterators is evident by this continued use of a prohibited poison in our staple staff of life.

These bleach poisons are "agers" of flour. They hasten the normal oxidation of the vitamins and enzymes. The most oxidizable component of flour is vitamin E. Vitamin E is essential to protect us from HEART DISEASE.

One of the components of the vitamin E complex is alpha-tocopherol. It is an anti-oxidant, probably protects the more potent factors in the complex from rapid destruction by oxidation.

Oxidation in the tissues of the human body runs wild if this alpha-tocopherol is not present in normal amounts. The consumption of oxygen may rise to 250% of normal.

Such accelerated oxygen takeup by the tissues seems to cause degeneration, like the corrosion of metals. Fats become rancid, phospholipid nerve sheaths are destroyed as in beriberi and pellagra, with paralysis and peripheral neuritis as end results.

Jonathan Forman, M.D., in the book, Soil, Food and Health (Friends of the Land, 1948), put the same idea this way: "...degenerative diseases can best be looked upon as the corrosion of the circulatory system...brought about by the constant and prolonged use of white flour, white sugar and other foodstuffs from which the essential vitamins and minerals have been removed or destroyed." (Page 317.)

The oxidation of tissue fats and phospholipids goes on in life until they actually become dead while the body is still alive. The Annual Review of Biochemistry, 1949, page 412, gives comments on the effect of vitamin E in preventing liver necrosis. It is, no doubt, this process that causes the sudden death in E deficiency so commonly proven in test animals and so possibly the cause of the parallel phenomena in the human family. HOW ELSE CAN SUCH SUDDEN DEATH TAKE PLACE? Some vital tissues must have lost their integrity and finally reached the point where they suddenly gave way. We know that the connective tissues can lose a great part of their strength in deficiency states; in fact the tensile strength of connective tissue is often used as a measure of vitamin C deficiency, as described in The Vitamins in Medicine, page 465.* Loss of two thirds of normal strength is common. Vitamin C, of course, is another oxygen metabolizer and oxygen-transport factor in the tissues.

* Published by Grune and Stratton, New York. Authors, Prescott and Bicknell, London.

Vitamin C complex* deficiency, we have long known, creates a characteristic fatigue state. How can anyone be otherwise if his tissues have lost their tensile strength up to two thirds of normal?

Another important cause of degenerative changes is a deficiency of the vitamin B complex, and of its various components. Riboflavin deficiency causes bloodshot eyes; so does a deficiency of any one of the amino acids, tryptophane, lysine or valine. (7)

A deficiency of niacin and pantothenic acid causes a degeneration of sensory nerve endings that produces persistent and intractable burning sensations in the areas affected, often the soles of the feet. (8)

This might be called a pellagra symptom; at least is commonly associated with pellagra, the most vicious of all the degenerative diseases of malnutrition, which sends its victims to the insane asylum by its destructive action on the brain, if they do not die sooner from paralysis, pernicious anemia, or gastrointestinal disease, such as ulcerative colitis.

The swollen, inflamed tongue of the pellagra syndrome is often seen where no other obvious signs are present. It is of interest that amino acids again often clear up this kind of lesion. Dentists prescribing raw bone flour for regenerating bone supporting tissue of the teeth report frequent cases of this kind that completely recover in a few days on the bone flour schedule. It is now known that tryptophane can correct niacin deficiency symptoms (9), and this explains why a diet high in corn meal produces pellagra. There is not much tryptophane in corn, and it is of interest to learn that Mussolini eliminated pellagra from Italy in a short time by prohibiting the use of corn as human food. (10) Before that, Italy led the world in deaths from this disease. The use of cane sugar greatly increased the damaging effect of corn in the diet, probably by reason of the sugar causing the destruction of what little tryptophane was available during digestion, the incompatibility of sugar and tryptophane being so critical if both are present in soluble form together.

The combined use of two amino acids, tryptophane and histidine, may be a better remedy for the treatment of pellagra than the usual vitamin schedule, to judge from the success some doctors have had (11), according to references available. This fits in with the fact that histidine is a well known remedy for peptic ulcers. (12)

*‡ In speaking of vitamin C we refer to the natural complex of ascorbic acid, vitamin P and K. Far less of combined forms of the C vitamin is required in preventing toxic reactions from drugs than of either of the ascorbic acid or vitamin P fractions (Annual Rev. Biochem., 1949, p. 439); and ascorbic acid and vitamin K together are necessary to prevent the toxic effect of sulfaguanidine (Vitamins in Medicine, p. 810); and ascorbic acid and vitamin P together are more effective than either alone in treating nasal and gingival hemorrhage (ibid., p. 866). One investigator decided that ascorbic acid deficiency caused one kind of subcutaneous hemorrhage; vitamin P deficiency, another (ibid., p. 474).

Peptic ulcers are one of the commonest forms of tissue degeneration of American life. Maybe we can elucidate this situation etiologically. Consider these circumstances:

- a. Nitrous acid destroys various amino acids, including tryptophane and histidine. (13)
- b. Nitrous acid, no doubt, is formed by the ionization of nitrites, if present in body fluids.
- c. Nitrites are common adulterants of meats and can also be formed from nitrates universally used as color preservatives in meat products. I will quote one authority here: "Packing plants for many years have been employing nitrite indirectly in their curing processes ... In pickle solutions the change of nitrate to nitrite is accomplished by means of aerobic bacteria which are present in the pickle." (14)

Here is a standard formula for a meat pickling solution:

400 Pounds granulated sugar
80 Pounds Saltpetre, otherwise known as potassium nitrate
12 Pounds Borax
12 Pounds Boracic acid

This is from the packing house handbook known as The Modern Packing House, page 310. The book further states, "The sugar has the effect of toning down the brash salt effect in the meat, giving it a more palatable flavor The saltpetre aids in curing the meat, and gives it a bright attractive color. Meat cured without saltpetre has a dead, slatish appearance, which is very unattractive. The borax has the tendency to whiten the meat, giving it a bright, attractive appearance. The boracic acid has the effect of preserving the pickle, preventing it from becoming ropy or out of condition." (15)

Now that we know what these embalming chemicals do to the meat, just what do they do to us?

1. The potassium nitrate acted upon by bacteria supplies the nitrite that destroys the histidine and tryptophane we need so urgently in our diet, plus the fact that tryptophane is destroyed by cooking with sugar-- and here is the sugar, added in the pickling solution. Did not we hear somewhere that the digestion and assimilation of carbohydrates and proteins interfered with each other if taken together? Let us keep in mind that they also must not be cooked together.
2. How much tryptophane a day do we need? Only nine milligrams a day, says one authority (16). Even that small amount probably would not survive the sugar treatment.
3. Histidine administration has been very effective in increasing hemoglobin formation in animal tests (17), so it is quite probable that if

the destruction in foods were to be sufficient to cause gastrointestinal ulcers, a concomitant tendency to anemia would be noted.

4. The success of amino acid preparations in ulcer treatment can be attributed, no doubt, to the extra histidine and tryptophane which, with lysine, are the hardest to get of all the amino acids, and the easiest destroyed by cooking and adulteration of food.
5. We have not yet discussed the possible consequences of the boron compounds used, the borax and boric acid. Today these poisons are considered so dangerous that their use even in treating wounds is being discontinued. Certainly, we cannot tolerate them in our food. On page 345 of Modern Packing House is this statement:

“The following is a very reliable formula for a preservative for all kinds of cooked sausage, including New England Pressed Ham--

72 Pounds powdered borax
10 Pounds boracic acid
19 Pounds very fine salt

6. According to a more recent authority, at the present only the salt-petre, as sodium or potassium nitrate, and nitrite as sodium nitrite, is being used in meat. (14) It seems as hard to eliminate these chemicals from meat as to eliminate preservatives from our cereals. The deep freeze seems the remedy for most of us.

What lesson can we learn from these few scattered facts on how common foods undermine our health? Simply that we must take the trouble in our homes to prepare our foods from the basic materials as far as possible, even to the extent of growing our vegetables and fruits on properly composted soil, if we can. The dividends will be quite possibly 20 years added to our life span, to say nothing of the life added to our years.

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