

THE SPECIAL NUTRITIONAL VALUES OF AMINO ACIDS

by
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Research of recent years shows that most of us get too much of the non-perishable and nonessential factors; too little organic minerals and vitamins. Unless we beware, we find ourselves consuming vast unnecessary quantities of calories to get the other essential food-stuffs we need. Now comes the question: Do we receive enough amino acids from the proteins we eat?

Perhaps we get enough protein, but like carbohydrates and fats, they are so low grade we still lack some rare ones. What are the major sources of protein, what is their biological value? Researcher Hindhede of Denmark concluded that potato protein was the best of all for human nutrition. Yet potato solids are only 10% protein, and it is said we can not tolerate starch. But we forget potato starch has an alkaline ash that is far better tolerated than the acid ash of cereals. Even so, when we supplement potatoes with meat or beans we arrive at a pretty good diet.

Nevertheless, most meat is just muscle. The rare amino acids needed to protect, repair, and build glandular organs must come from glandular organs: from liver, kidney, pancreas or sweetbreads. There also are rare aminos in the skin. Hence, when we learn that liver sausage formulas call for about half pork skins and tripe, we can assume the amino acid balance is very good as a supplement for muscle meat.

When eating protein it must be split into amino acids in order to get through the membrane walls of the alimentary tube, for proteins as such are not diffusible. If they do get in without being completely broken down, they may cause allergic reactions. In the presence of colitis and other irritated conditions of the intestinal tract, half-split proteins can get into the circulation. This is probably the reason for your aversion and reaction to certain foods you have overeaten--sometimes may have taken in a partly decomposed state. It is a known fact that bacterial decomposition renders any protein more toxic.

When your alimentary tract is filled with a half-digested protein mass, with inherent powers of inflammation, some of the proteins will be forced through. After that your immune mechanism reacts violently even to only small quantities of the same protein. This is why a man, once made ill from eating lobster, cannot tolerate any of it at all for a long time. He is actually allergic to lobster.

Vegetarians can supplement their potatoes with milk, cheese, butter, beans or sprouts. And bean sprouts bring us to that old amino acid product, soy sauce, invented thousands of years ago by the Chinese. The flavor is especially like glutamic acid.

There are 22 known amino acids, but only eight are considered indispensable to nutrition. While a great deal is known about them, much more knowledge must be gained before even a general pattern is established in this field of biochemistry. Glutamine and betaine may be considered only as first cousins to the amino acids.

Glutamine is a buffer because it can split into ammonia and glutamic acid. Its absorption by the tissues, particularly bones and teeth,

sometimes causes temporary shortage elsewhere. But glutamine is very fragile, is immediately destroyed by heat. Hence cooked foods are devoid of it. However, it is one of the commonest substances in plant juices, especially those that are grown in soils rich in ammonia.

Glutamine promotes the fixation into bone of blood calcium; and also explains the fact that raw meats and fish insure a state of health to tooth-supporting structures, preventing pyorrhea. The best dietary source of glutamine is celery root.

Betaine, the other "first cousin" to aminos, has been found to destroy tetanus toxin on contact. Some believe that in pernicious anemia and other diseases betaine has a theoretical promise of benefit.

Methionine is one of the amino acids that has a vital importance just becoming appreciated. It supplies the methyl radical for conversion of a poisonous substance in the blood into a useful one. Namely, it converts guanidine into methylguanidine. So methionine is a link in the chain of factors needed to prevent convulsions; and it is particularly successful in preventing the convulsions of pregnancy. Again, the use of small doses of methionine is often followed by immediate improvement in some cases of fatigability.

It is now known that a dosage of excess vitamin B is followed by liver degeneration and cirrhosis. These reactions are really methionine deficiency, aggravated by the increased demand made by the B. Methionine is one of the materials required by B to do its work, and its place can be taken by betaine which is normally a part of the natural B complex from wheat germ.

The effect of threonine, another amino, in deficiency has not yet been determined. It has only been known since 1935.

Next is lysine, whose deficiency causes capillary breakdown and vascularization, obvious in the cornea, simulating riboflavin deficiency. According to tests, 1% of the diet must be lysine, the requirement for this amino being greater than for any other. Lack of it causes humans to feel worn out and irritable. Lysine is not well distributed in vegetable proteins but is plentiful in blood sausage or head cheese. It affords stamina and endurance.

Tryptophane, an amino acid, is found in fair quantities in milk, but not enough to compensate for deficiencies in other foods. Wheat protein is better than most vegetable sources, but is still lower than in milk.

Tryptophane is known as a protection against dental caries. It is destroyed by heat and acid hydrolysis. This may be the reason why the worst teeth are found in children who have no access to raw vegetables; also why raw potatoes are so good as a caries inhibitor.

The amino family also includes leucine, essential to growth and needed in greater amounts in children's diet. It is found in best amounts in animal foods with some exceptions, hemp seed protein being 20% leucine. Otherwise, eggs, milk, and wheat are fair sources. Incidentally, hemp seed protein is one of the few vegetable sources that is well-balanced and contains all the indispensable amino acids sufficient to promote growth. In this respect, hemp seed is unique.

Valine is another amino that is essential to muscular stamina. In its deficiency a person becomes extremely tired and sleepy. Best source for valine is milk, hemp seed is second, wheat a poor third.

The eighth indispensable amino acid is phenylalanine. It is another growth requisite, found most plentifully in eggs, less so in peas, least in milk.

It is important to remember that protein metabolism is dependent upon liver integrity. Factors that embarrass the liver interfere with such metabolism and tend to cause possible deficiency. Frequently, the liver is abused by excessive use of vitamin B1 where the rest of the B complex is not supplied in sufficient quantity. These protective factors are the fat metabolizers, including betaine, choline or lecithin. The amino acid methionine can also protect the liver against damage from vitamin B1 ingestion.

This toxic action on the liver is quite common, many patients reporting vitamin B concentrates or synthetic B1 creating unfavorable reactions which usually are corrected by treatment directed to the liver. Very helpful is sodium phosphate.

Some years ago in Germany a group of coal miners was put on a ration that included one gram a day of sodium phosphate crystals. Their work output increased 20%.

The splitting of proteins in vital tissues like the liver, bone-marrow, and the brain by hydrolysis, and their use clinically, has been very encouraging. The amino patterns in these tissues are quite different from those found in the simple foods. They appear to correct many of the common symptoms of deficiency, such as poor endurance, slow rate of healing, lowered vitality; and they act as an aid in correcting the nerve degenerations of older people. Gastrointestinal ulcers seem to respond well, too, probably by the better healing rate, in which the growth vitamins in the B group, otherwise known as the G complex, seem to be important synergists or catalysts.

Heart sufferers of advanced years are good prospects for amino acid treatment, for overwork can only cause degeneration where repairs are delayed. The success of the growth vitamins for this type merely shows the need for their partners, the aminos. Main function of the G complex seems to supply the essential factors for the protein metabolizing enzymes, while the amino acids supply the structural material to be metabolized.

As the special amino acids become available, they undoubtedly will find special uses. But meanwhile, the natural amino acid complexes of the specialized organs are being used with considerable success. We must await the accumulation of clinical experiences for more detailed information as to their application, both in therapy and nutrition.