

¹ Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. *J Appl Physiol.* 2000 Feb;88(2):386-92.

² Walser, M. *Coping with Kidney Disease How to Avoid Dialysis.* John Wiley & Sons

We are often asked about the formula of essential amino acids we produce and why Dr. Walser used this particular formula. Why not use one of the cheap formulas made from whey or casein (waste proteins from cheese production)?

The amino acids are the building blocks of proteins (think bricks in a wall). The essential amino acids for humans are the 9 found in our essential amino acid formula. This formula was developed in the 1950's based on work to find out which amino acids were "essential" for human nutrition. Of the 20 common amino acids found in proteins, 9 could not be made by humans and were thus said to be "essential" in nutrition. The other 11 common amino acids could be made by our bodies from the 9 "essential" amino acids. Cheap proteins like whey and casein, or expensive ones like sirloin, fish or chicken, contain both essential and non-essential amino acids.

From time to time a customer will try to substitute amino acids bought from a local nutrition store or pharmacy. The most common products will have something to the effect, "contains all the essential amino acids." But, they have the other "non-essential" amino acids as well. The problem with these protein powders, even when digested either chemically or enzymatically, is that they will form creatinine and blood urea nitrogen in the body.¹

The other major problem with the products which contain "all" the amino acids, is they do not promote muscle and protein formation to the same extent that the "essential amino acids" do. When whey (a commonly used protein powder constituent) was used, the muscle formation was 70% less than when just the essential amino acids were used.¹

There are formulations of just the "essential amino acids" available. But the percentage of each of the amino acids in the formulation makes a difference. Dr. Walser always referred to his essential amino acid formula as "balanced." What is meant by that term is the percentage of each individual amino acid in the formula has been chosen so that all the essential amino acids are used by the body and none are wasted (to be handled as waste by the kidneys). This is especially important for the individual on a low protein diet since their muscle/protein formation is completely dependent on the amino acids in their medical food (e.g. Nutrasentials).

The formation of muscle is limited when an amino acid is not present in a high enough level for all the others to be used. In science this is known as being "limited by the nutrient in shortest supply." For example, if a fertilizer is not balanced, some of the nutrients will be wasted and run off into the water supply. Fertilizer is useless if there is not enough water.

Or, think about a person who finishes dinner with too much of one food still left on the plate. That's wasted. Often a person will get just a little more of one or two foods on the plate to "finish the meal" (they may say, "balance it out").

In the same manner, an essential amino acid formula which has too little of one of the essential amino acids in the mixture will waste the leftover amino acids, because one nutrient limits the use of the others. In the pharmacy or vitamin store amino acid mixtures, the most foul smelling amino acids are kept at low concentrations to improve the taste, but their lack limits the use of the other amino acids by the body because the protein being built cannot be completed.

You already know that the low protein diet is difficult to follow, but Dr. Walser's balanced formula of essential amino acids can keep your serum albumin level over 4.0 where it belongs and allow you to continue avoiding dialysis.