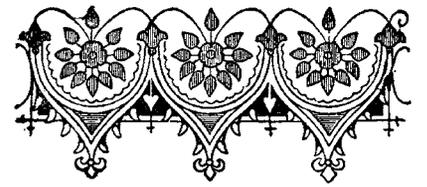


# Health & Medicine



## Dietary Amino Acids Improve Health and Longevity



Dr. Kate Thomsen and Silky

About 1 year ago we started a new weight loss program at our office. It has worked more successfully than other weight loss programs we have implemented and people are feeling good on it as well. I suspected many of these good results were directly related to using an amino acids product. As I researched more about it, turns out there's a whole lot more we need to get to know about the power of amino acids.

Amino acids are the building blocks of proteins. There are 20 different amino acids that humans need for building proteins. Eight of these must be obtained from the diet and are termed essential amino acids. The other 12 can be made by the body. Think of a protein as a long chain of hundreds or thousands of amino acids, strung together and then twisted and folded into unique functional shapes. I think of the individual amino acids as the "Legos". Just like with a set of Legos, the combinations of amino acids seem endless.

Except for water, proteins are the most abundant substance in our bodies. They have several functions: 1. Structure and support (Hair, skin, eyes, muscles and organs are all made of protein), 2. Proteins can be used to make energy (though carbohydrates are the preferred source of energy), 3. Messengers (Insulin is a small protein hormone messenger that travels to communicate it's message between cells), 4. Enzymes (These are proteins that speed up chemical reactions in the body - like

digestive enzymes), 5. Transportation and Storage of molecules (The protein hemoglobin transports oxygen and the protein ferritin stores iron), and 6. Antibodies (The tags that your immune system places on "unwanted" molecules are also made of protein). I want to discuss 2 of these functions: making muscles and making energy.

In a weight loss program, it is common to calculate the BMR. The Basal Metabolic Rate is the amount of energy the body is spending just to stay alive - no extra activity. The BMR for women is about 2000 kcal and for men it is about 2700 - 2900 kcal/day. This BMR accounts for 70% of one's daily energy expenditure. More than half of this basal metabolic rate is dependent upon the amount of muscle the person has. Muscle cells contain many more of the energy producing mitochondria (see last issue's article on mitochondria) than most other tissues. Mitochondria require calories (typically in the form of glucose) as they make ATP to continuously oxygenate cells and maintain an alive resting state.

Aging and obesity are associated with less muscle mass and consequently lower basal metabolic rates. With a lower basal metabolic rate, one has to eat less or else gain weight. This makes weight loss more problematic. A study of obese persons on a very low calorie diet found that aerobic exercise and resistance exercise produced the same amount of weight loss after 12 weeks. The aerobic exercise individuals had a 10# muscle loss and a lowered BMR while the resistance exercise individuals had no muscle loss and an increased BMR. Similarly, we know that reducing calorie intake (dieting) decreases BMR - less resting calories burned. The body will be hungry and will continue to eat and gain weight until it

normalizes the Basal Metabolic Rate. Losing weight and keeping it off seems only possible by increasing the basal metabolic rate - making more muscle.

Building muscle should not be that hard. Doing resistance exercise 3 x/week and getting the amino acids needed by eating adequate protein every day should do it. This may be possible when we're young, but after the age of 40 protein digestion is impaired. There's less stomach acidity and fewer digestive enzymes available. Research has shown that supplementing with amino acids can increase muscle mass and increase the quantity and quality of the mitochondria in those muscle cells (producing more ATP).

When amino acids are taken orally (powders or capsules) they are easily absorbed, requiring no energy. They raise the blood levels of the circulating amino acid pool and are transported into cells, again with no ATP energy expenditure. Once inside the cells, amino acids will activate the production of proteins - some of these will be muscle proteins. They also turn on a pathway inside the cells that will increase the quantity and function of mitochondria in the cells - producing more energy. Recent research has shown that increasing muscle and mitochondria this way has improved insulin sensitivity and diabetes, and decreased cardiovascular risk. These studies did not include exercise as a treatment - just an amino acid mixture. In middle aged mice, amino acid supplementation was shown to decrease oxidative stress, increase antioxidant defense systems, increase the number of mitochondria, improve the quality of mitochondria, and increase life expectancy 12%. Researchers are now studying the effects of amino acid supplementation for neurological issues, as well as other

**Dr. Kate Thomsen**  
 WOMEN'S HEALTH AND WELLNESS  
 Pennington, NJ

**Congratulations to Dr Thomsen!!!**  
 She passed her exam in September and is now one of an elite group of 124 providers certified in Functional Medicine.

As a graduate of The Institute for Functional Medicine's Certification Program (IFMCP), Dr. Thomsen is uniquely trained in the functional medicine model to identify and treat the root causes of chronic disease. In order to achieve the designation of IFM Certified Practitioner, Dr. Thomsen has completed 7 onsite training seminars and passed stringent written and case study evaluations.

**About Functional Medicine:**  
 The rising rates of chronic disease are creating a huge burden on the economy and the current health care system is not adequately addressing the problem. Conventional health care is rooted in an acute-care model focused on rapid diagnosis and long-term pharmaceutical interventions. Functional medicine is a model for 21st century health care that focuses on identifying and addressing the underlying causes of chronic disease by recognizing that each patient is biochemically unique, a product of the continuous interaction between their genes, their environment, and their lifestyle choices. Only by finding the specific causes of each patient's disease and providing treatment that is individualized to that patient will we be able to reverse the epidemic of chronic disease.



Office of Dr. Kate Thomsen  
 252 West Delaware Ave., Pennington, NJ 08534  
 PHONE: 609-818-9700

degenerative and inflammatory conditions.

Amino Acid supplementation appears to keep the body in an anabolic (building) mode, rather than a catabolic (breaking down) mode. In my patients I have seen it improve mood, decrease food cravings, increase energy, and speed tissue repair. Certain combinations of amino acids may work better than others. Additional additives may or may not enhance the effect. I think this nutritional intervention holds a lot of promise for many of our chronic conditions today.

*Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is board certified in Family Medicine, Integrative/Holistic Medicine, and Functional Medicine. She has been practicing Functional Medicine for over 15 years. For more information see [www.drkatethomsen.com](http://www.drkatethomsen.com) or call the office at 609-818-9700.*