



# INTRODUCTION TO AMINO ACIDS

## AMINO ACID “BEADS” MAKE PROTEIN “NECKLACES” AND MORE!

Amino acids make up the proteins that build and maintain tissues, such as skin, muscle, and nerves, and organs, such as the heart and brain. They are also precursors of “messenger” substances (hormones, neurotransmitters) required for normal brain and body function. Moreover, the body can use amino acids to produce energy. Think of amino acids as “beads” which the body can rearrange to make many different types of protein “necklaces”—insulin, hemoglobin, actin, myosin, antibodies, peptides, enzymes, etc.

Specific amino acids play key roles in the body. Arginine and ornithine are precursors of human growth hormone, which aids fat-burning and lean muscle development. Likewise, tyrosine is necessary to produce epinephrine and norepinephrine, hormones which ready the body to meet physical and mental challenges (the so-called “fight or flight response”). Tyrosine is also a precursor of dopamine, an important neurotransmitter. Similarly, tryptophan is required for the production of serotonin, a substance necessary for normal brain and nerve function.

## FREE-FORM AMINO ACIDS ARE ABSORBED WELL

Twenty-two amino acids are involved in human nutrition. Of these, nine are dietarily essential for adults, as they cannot be made by the body in sufficient quantity. Children require a tenth (arginine). The diet — the foods and supplements we consume — must supply ample amino acids for optimal health.

When we consume meat, milk, eggs, or other protein foods, the proteins are digested, or broken down, into amino acids. These amino acids are then absorbed through the intestinal lining, taken directly into the bloodstream, and transported to sites where they will be utilized.

The body rapidly absorbs “free-form” (individual) amino acids. The amino acids present in the largest amounts are absorbed in the greatest proportions. If a food has large amounts of arginine, for instance, blood levels of arginine will be high after that food is consumed.

## AMINO ACIDS HELP THE “METABOLIC MACHINERY” RUN SMOOTHLY

Amino acid utilization is prioritized in the body. This means the most important needs are met first. If too few amino acids are available for the body to make a particular protein, that protein might not be made. Over time, deficiency symptoms can occur if the diet provides an insufficient amount of an essential amino acid or if some metabolic process or change causes the demand for an amino acid to exceed its supply. The effects of a lifetime of marginal amino acid deficiencies are not yet fully understood, but it is likely that long-term deficiency undermines metabolic efficiency and limits the body’s ability to perform at peak efficiency.

Metabolism includes all of the cellular workings that support production of biologically important substances, growth and maintenance of tissues and organs, reproduction, creation of energy for life, and elimination of wastes. While a deficiency of amino acids can undermine metabolic efficiency, an abundance may ensure that the body’s “metabolic machinery” runs smoother.

## RESEARCH APPEARS PROMISING

As researchers continue to unravel the roles and relationships of amino acids in the body, the importance of these minute biochemicals becomes more apparent. Many researchers feel that utilization of amino acids alone or in concert with other nutrients may result in more efficient cellular function, stronger immunity, more balanced hormone production, greater physical development, and even better methods of dealing with inherited diseases such as phenylketonuria, a defect of amino acid metabolism that can lead to severe mental retardation.

## GNLD ADVANTAGES IN

### AMINO ACID SUPPLEMENTATION

- **Knowledgeable and experienced formulators.** GNLD formulators have extensive knowledge of amino acids, the building blocks of protein. The leader in protein supplementation, we have long used natural free-form amino acids to maximize the quality of our protein supplements. Our expert knowledge of amino acid functions and interactions, coupled with our experience with amino acid raw materials, enables us to deliver safe products that set the “gold standard” in amino acid supplementation.
- **Specific, natural, free-form amino acids for metabolic support.** GNLD amino acid supplements contain only 100% natural free-form amino acids. Specific amino acids play key metabolic roles in the body. Simply eating high-protein foods will not boost blood levels of *specific* amino acids. But boosting levels of specific amino acids may support the body’s natural ability to produce biologically important substances. GNLD supplements contain unique combinations of amino acids to support the body’s ability to carry out key metabolic functions.
- **Helper nutrients.** Your body can derive greater benefits from amino acids if “helper” nutrients are present as well. GNLD includes helper nutrients in each formulation. For instance, if the desired effect is lean muscle development and fat burning, GNLD products are formulated with lipotropic factors to help mobilize fat and keep it in solution as it is transported about the body. If the goal is a higher energy level, our products are formulated with herbs traditionally used to support vitality and stamina, plus minerals to support energy production and the function of nerves and muscles.

Assuring adequate daily supplies of high-quality protein is essential to optimal health. Using specific free-form amino acids to support equally specific metabolic conditions or activities may make a beneficial difference not otherwise achievable.