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### ***The health benefits of amino acids.***

Amino acids are needed to build the various proteins used in the growth, repair, and maintenance of body tissues.

Amino acids play innumerable roles in your dog's health and disease.

**Alanine** is necessary for the promotion of proper blood glucose levels from dietary protein.

Alanine stimulates lymphocyte production and may help those that have immune suppression.

Alanine strengthens the immune system by producing antibodies.

**L-arginine** is used by the immune system to help regulate the activity of the thymus gland, which is responsible for manufacturing T lymphocytes. The body uses arginine to produce nitric oxide. Nitric oxide is an endogenous messenger molecule involved in a variety of endothelium-dependent physiological effects in the cardiovascular

system. In the central nervous system, asparagine is needed to maintain a balance, preventing over nervousness or being overly calm. Aspartic acid can help protect the liver from some drug toxicity and the body from radiation.

**Carnosine** is the water-soluble counterpart to vitamin E in protecting cell membranes from oxidative damage. L-carnosine supports healthy aging and cellular rejuvenation by its effects on two mechanisms:  
glycosylation  
free radical damage.

**Cysteine** strengthens the protective lining of the stomach and intestines, which may help prevent damage caused by aspirin and similar drugs. The health benefits of glutamine include immune system regulation, nitrogen shuttling, oxidative stress, muscle preservation, intestinal health, injuries, and much more.

**Glycine** is an inhibitory amino acid with important functions centrally and peripherally. Glycine may be indicated to help alleviate the symptoms of spasticity. Histidine is known to be vital in the maintenance of the myelin sheaths surrounding nerves, particularly the auditory nerve and is used to treat some forms of hearing disability.

**Isoleucine** is necessary for the optimal growth of infants and for nitrogen balance in adult dogs.

**Leucine** is used as a source for the synthesis of blood sugar in the liver during starvation, stress, and infection to aid in healing.

**Lysine** is used in managing and preventing painful and unsightly herpes sores caused by the herpes simplex virus (HSV).

**Methionine** is both an antioxidant and lipotrope, meaning it helps remove fat from the liver.

**Phenylalanine** is used to treat depression, rheumatoid arthritis and osteoarthritis, menstrual cramps, Parkinson's disease, vitiligo, and cancer.

**Proline** is an important component in certain medical wound dressings that use collagen fragments to stimulate wound healing.

**Serine** is needed for the metabolism of fats and fatty acids, muscle growth, and a healthy immune system.

**Taurine** helps regulate the contraction and pumping action of the heart muscle and it helps regulate blood pressure and platelet aggregation.

**Threonine** may enhance immunity by assisting in the production of agents that fight viral infections.

**L-theanine** reduces stress and anxiety without the tranquilizing effects found in many other calming supplements.

**Tryptophan** is important for the production of serotonin. Increasing tryptophan may help to normalize sleep patterns.

**Tyrosine** may act as an adaptogen, helping the body adapt to and cope with the effects of physical or psychological stress by minimizing the symptoms brought on by stress. As a branched-chain amino acid (BCAA) >>

**Valine** has been found useful in treatments involving muscle, mental, and emotional upsets, and for insomnia and nervousness.

**Creatine** supplements fuels and enhances short bursts of high-energy exercise. Creatine prevents the body from relying solely on the process of glycolysis.

**Citrulline** supports the body in optimizing blood flow through its conversion to L-arginine and then nitric oxide (NO). GABA has been used in the treatment of depression, manic-depressive (bipolar) disorder, seizures, premenstrual dysphoric (feeling depressed) disorder, and anxiety.

**Glutathione** are necessary for supporting the immune system, glutathione is required for replication of the lymphocyte immune cells.