Blachier F, Boutry C, Bos C, Tome D. *Metabolism and functions of L-glutamate in the epithelial cells of the small and large intestines.* Am J Clin Nutr 2009;90(suppl):814S–21S.

**Abstract**

L-Glutamate is one of the most abundant amino acids in alimentary proteins, but its concentration in blood is among the lowest. This is largely because L-glutamate is extensively oxidized in small intestine epithelial cells during its transcellular journey from the lumen to the bloodstream and after its uptake from the bloodstream. This oxidative capacity coincides with a high energy demand of the epithelium, which is in rapid renewal and responsible for the nutrient absorption process. L-Glutamate is a precursor for glutathione and N-acetylglutamate in enterocytes. Glutathione is involved in the enterocyte redox state and in the detoxication process. N-acetylglutamate is an activator of carbamoylphosphate synthetase 1, which is implicated in L-citrulline production by enterocytes. Furthermore, L-glutamate is a precursor in enterocytes for several other amino acids, including L-alanine, L-aspartate, L-ornithine, and L-proline. Thus, L-glutamate can serve both locally inside enterocytes and through the production of other amino acids in an interorgan metabolic perspective. Intestinal epithelial cell capacity to oxidize L-glutamine and L-glutamate is already high in piglets at birth and during the suckling period. In colonocytes, L-glutamate also serves as a fuel but is provided from the bloodstream. Alimentary and endogenous proteins that escape digestion enter the large intestine and are broken down by colonic bacterial flora, which then release L-glutamate into the lumen. L-Glutamate can then serve in the colon lumen as a precursor for butyrate and acetate in bacteria. L-Glutamate, in addition to fiber and digestion-resistant starch, can thus serve as a luminally derived fuel precursor for colonocytes.

Glutamate is glutamic acid.