Lactic Acid Encyclopedia Article

Lactic Acid

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Lactic Acid

Lactic acid, or 2-Hydroxypropanoic acid, is one of a family of organic carboxylic acids produced by biological organisms. It is found in the blood and muscles of animals, and is a constituent of some plant juices. It is an important acidic component of fermented food products such as yogurt, buttermilk, sauerkraut, green olives, and pickles, where its formation typically results from the activity of bacteria. Lactic acid bacteria may be members of any of several genera of rod- or sphere-shaped gram-positive bacteria that form lactic acid as a major product of carbohydrate fermentation. Two genera, Lactobacillus and Streptococcus, contain some of the most active lactic acid producers.

Lactic acid is produced in active muscle tissue from the break down of glycogen, a carbohydrate used as an energy source for muscle movement. The pathway consists of the breakdown of glycogen to glucose, which is then converted to lactic acid in a series of reactions coupled to formation of ATP from ADP and phosphate. The ATP is used directly to energize muscle movement. The lactic acid is picked up by the blood and delivered, in the form of lactate salts, to the liver where it is converted back to glycogen. In an active muscle, the removal of lactate from the muscle is slower than its production, and if the muscle remains active for an extended period lactate will accumulate and eventually cause muscle fatigue and cramps. Lactic acid is used in a variety of industrial processes including tanning leather and dyeing wool. It was first isolated in 1780 by the Swedish chemist, Carl Wilhelm Scheele.