



3b. Strenuous Exercise and Acid

Under certain conditions, such as oxygen depletion during strenuous exercise, the glucose sugar in muscle cells is oxidised to lactate. The concentrations of lactate from anaerobic glucose metabolism and the concentrations of acid (protons) from ATP hydrolysis are referred to frequently as lactic acid. Lactic acid concentrations are highly detrimental to muscle cells and dramatically affect performance.

During strenuous exercise, the metabolism of muscle sugars also produces large concentrations of carbon dioxide which add to the acid load of the muscle cells. The metabolism of muscles can increase up to sixty times and the acid concentrations of muscle cells can increase up to twenty times during strenuous exercise. Under these conditions, the organic and inorganic phosphate buffers inside muscle cells are used up very quickly. Acidic intracellular conditions prevail. Athletic performance is further affected detrimentally. Severe body fatigue often ensues.