

Unless You Balance Acidity Your Muscle May Become Tense

By Frank Murray, Sports Nutrition

Your muscles are designed to work well only in a narrow range of almost zero acidity, according to Michael Colgan, PhD in Optimum Sports Nutrition. Arterial blood works best with no acid at all. Acidity is measured by the concentration of hydrogen ions (pH). A pH of 7.0 is neutral, midway between very acidic (pH of 1) and very alkaline (pH of 14), he explained.

“The pH skill is water arithmetic, like the skills of earthquakes,” Colgan said. “So small changes in the numbers mean large differences in acidic E alkaline 80. A pH of 6 is Ten times more acidic than a pH of 7. At rest, muscle pH is about 6.9, while arterial blood is about 7.4.”

As you begin to exercise, he continued, the increase use of muscle glycogen for energy produces lactic acid and pyruvic acid, to substance which contain a lot of hydrogen ions (H+), which drive muscle and blood pH down into the acid zone. (Incidentally, pH is derived from the French pouvoir hydrogene, meaning hydrogen power.)

Colgan goes on to say that the harder you exercise, the quicker you “go acid.” When muscle pH drops below 6.5, the acidity disrupts all sorts of links in the energy chain. For example, the enzyme phosphofructokinase is the rate limiting step in muscle use of glycogen. Below pH 6.5, it stops working altogether. And, he says, acidity also reduces muscle power directly by inhibiting the contractile action of muscle fibers.

“So,” Colgan added, “The first thing that a successful ergogenic supplement has to do is reduce the accumulation of acidity in exercising muscle. You can put all sorts of other chemicals into the bloodstream, but unless you reduce acidity during exercise, your muscle will tie up.

Another inhibitor of exercise, Colgan said, happening simultaneously with the accumulation of acid, is the accumulation of ammonia; anaerobic and endurance exercise produces a lot of it. Ammonia is toxic to cells, it reduces the formation of glycogen, and it inhibits the energy cycle. He adds that, although we still do not know how much ammonia contributes to fatigue, we do know that the higher your blood ammonia, the poorer your performance.

Immediately after marathon races, triathlons or other endurance events, some athletes have very low blood phosphate levels, Colgan said. Even athletes with high resting phosphate levels show marked reductions after endurance exercise. “How does this loss of phosphate damage performance?” Colgan asked. “First, there is a loss of acid buffering. Phosphate is a major alkaline buffer of muscle.

Second, to make new muscle glycogen, your body has to use phosphate, a mix of phosphate and vitamin B6.”

Since many people, including athletes, do not consume enough alkaline rich foods, such as fruits, nuts and vegetables, but instead rely heavily on acid forming foods, such as meat, fish, poultry, eggs, etc., they may be at risk for an acidic condition in their body fluids.

The fastest and the most effective way to neutralize the acidic condition and balance the body pH is to drink alkaline ionic water. Besides the alkaline pH the ionic alkaline water has reduced water molecular clusters which enable the water to be readily absorbed by body cells, hydrating the body and at the same time getting rid of the acidic waste from the body quickly.