

Energy systems

There are mainly 3 energy systems involved.

It is very important to understand that ATP is necessary for all muscle contraction, without the necessary ATP available muscle will cease to contract.

1. Anaerobic a lactic

This is also called the start up system. This system relies on ATP that is stored in muscle cells. This system does not require oxygen to reproduce ATP and does not produce lactic acids. The main source that this system uses for reproducing ATP is Phosphor Creatine that is also stored in muscle. This energy system does not last long, anywhere between 4 to 10 seconds. **Sprinters** mainly rely on this system. Best distance to develop this energy system is from 20m to 80m at 100% intensity. Recovery should at least be 3 times of the time that the distance have been run to ensure that there is no lactic build up and ATP are restored .

2. Anaerobic lactic

This system also does not require oxygen to produce ATP, but do produce large amounts of lactic acid that cause muscle to seize and the so called hitting the wall feeling. This system uses a process called Anaerobic Glycolysis to produce ATP through a Chemical process. Glycogen is stored in muscle cells and the liver. The best distance to train this energy system is from 10 seconds to 1 min in duration or over a distance of 80m to 400m at 85% – 100% intensity. Rest should be from 30 seconds to 3 minutes.

3. Aerobic

Uses oxygen, together with glycogen and fats, to produce ATP. This occurs in the mitochondria of the cells. The larger the Mitochondria the more ATP it can produce. Mitochondria are situated in type 1 fibers or red fibers, also called slow twitch fibers that are oxygen rich. This system does not produce large amounts of lactic acid. Distance running from 1 min to 60 min is the best way to train the system. Tempo runs like continuous tempo, hart rate 120 to 140 beats – extensive tempo, hart rate 140 to 170 and intensive tempo hart beat 170 to 200 beats per minute are ways to train aerobic systems.