

Conditioning 101

How To Most Effectively Program for Conditioning

Which Athlete Has a Higher Level of Conditioning?



Floyd Mayweather



Aaron Rodgers

What Is Conditioning?

Conditioning is a measure of how well an athlete is able to meet the energy production demands of their sport. -Joel Jamieson

ATP- Adenosine Triphosphate

In the most simple terms:

Good Conditioning= Your body develops ATP as fast and for as long in duration as the sport or activity requires.

Bad Conditioning= It doesn't....

Think of Your Body As a Car

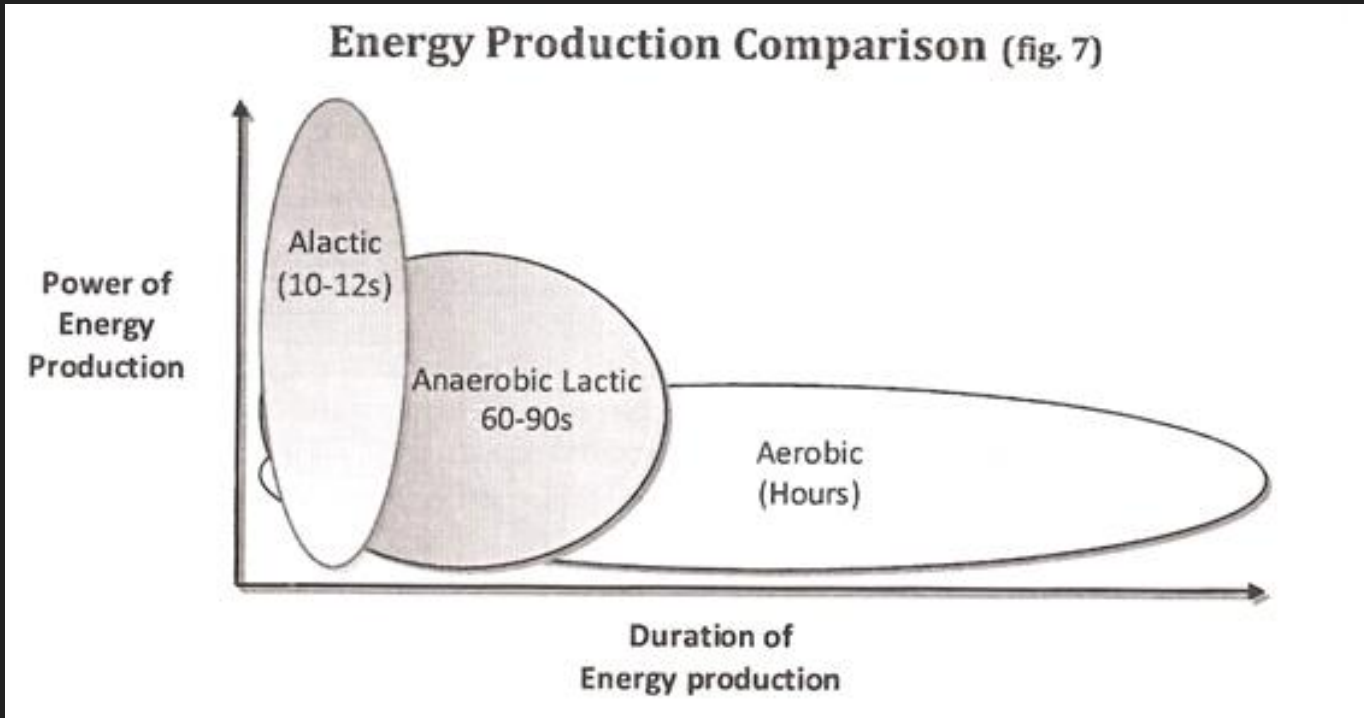
- 4 body systems need to be trained specifically and they all must work closely together to operate as efficiently as possible.
- Training these systems to be a cohesive unit results in an increase in biological power, the base of conditioning.

These systems are:

- Neuromuscular- The muscles of the body and the nerves that supply them
- Cardiovascular- Circulates blood through the body including the heart, blood vessels, etc.
- Hormonal (Endocrine)- Regulates the activities of the cells and organs throughout the body
- Metabolic- Converts the food we eat into energy the body can use

Energy Systems

Notice how all of the systems overlap



Every system has a **POWER** (how much energy can the system produce) and **CAPACITY** (how long can the energy system supply that energy) component

Aerobic Energy System

- Long term energy system used in times of long exercise at low intensities being either continuous or interval (cross country, tempo running)
- The only system that can utilize and break down fats to form ATP; Fats provide more energy than sugars at 9 calories per gram instead of 4 calories per gram.
- The Aerobic system also has a large influence on anaerobic processes (to be covered later)
- An athlete may increase Aerobic power by increasing their Anaerobic threshold (This threshold, usually characterized by a specific heart rate, is the limit of your aerobic energy production). The higher the threshold, the higher the aerobic power.
- Aerobic Capacity relies on numerous factors including but not limited to; Blood flow to the working muscle(s), Oxygen uptake of the working muscle(s), substrate/sugar stores (think of this as your body's gas tank)

Aerobic Energy System Training

-Cardiac Output-The amount of blood the heart pumps through the circulatory system in one minute of time.

-To improve the cardiac output we need to look into the factors that influence it; Stroke Volume (SV) & Heart Rate (HR).

-In order to increase SV (the amount of blood pumped by the left ventricle in one contraction) we need to increase the size of that left ventricle. This is done with long long and slow training labeled by the cardiac output method

Aerobic Energy System Training

- Cardiac Output Method

-Train with a consistent HR around 120-150 bpm

-1-3 times/week for 45-90 mins/session; increasing in volume over time.

-Activities such as biking, jogging, swimming, jumping rope, LIGHT medicine ball work, sport specific technique drills etc.

To complement the Cardiac Output method, this training template (among others) can be used

-Tempo Method- Increase oxygen utilization of working muscles (Slow Twitch) by causing local hypoxia (oxygen deficiency) to the working muscles.

-Train with 2 second concentric/eccentric actions per rep (no pauses); 3-5 sets of 8-10 reps of 3-4 exercises per workout.

Anaerobic Lactic (Glycolytic) System

- Responsible for moderate bursts of activity in duration at high intensities (400 meter sprint, wingate test)
- Glycolysis- The breakdown of glucose by enzymes producing energy (2)(ATP) and pyruvate(2)
 - In times of aerobic activity the pyruvate is placed into the krebs cycle and glycolysis begins. When oxygen is not readily available the pyruvate is converted to lactate and anaerobic processes take over. *this process can be reversed*
- During Anaerobic Lactic activity the anaerobic processes pair with hydrogen ion production. The accumulation of hydrogen ions is believed to be the cause of the muscle “burning” sensation.
- The aerobic system and processes are responsible for clearing lactate in times of anaerobic activity, the more lactate left sitting around the more fatigued an athlete becomes. (This is why aerobic training is important for even the most anaerobic alactic sport athletes)

Anaerobic Lactic (Glycolytic) System Training

-Cardiac Power Intervals- Increase cardiac tissue contractility (how forcefully the left ventricle can contract). (Jaimeson)

-Train at maximal HR for 60-120 seconds with 2-5 minutes of recovery between intervals at 120-130 bpm. 4-12 reps/session in 1-2 sessions/week.

LACTIC POWER

- Lactic Power Intervals (Jaimeson)

- Train with explosive exercises for 20-40 seconds with full recovery between bouts, perform for 3-4 rounds.

- Resistance Training Drop sets

LACTIC CAPACITY

- Lactic Capacity Intervals (Jaimeson)

- Train at maximal intensities for 90-120 seconds with 1-2 minutes rest for 3 rounds (complete exhaustion)

Anaerobic Alactic (ATP-PC) System

- Adenosine Triphosphate - Phosphocreatine or Creatine Phosphate (CP)
- Short bursts of activity at very high intensities (10-15 seconds)
- The ATP-PC system is the initial fuel for exercise
- ATP and PC are used as the main source of energy and run for about 10-15 seconds (but never fully exhaust) before being taken over by lactic processes.
- Both ATP and PC are replenished by aerobic processes* (again this is why even the most alactic athletes need to train aerobically)
- Short Sprints, Jumps, Max Lifts, ETC.

ATP-PC System Training

ALACTIC POWER

- Max Effort Sprints/ Jumps/ Strength Training with full recovery (Improves rate of ATP regeneration by the alactic system)
 - Sprinting- 45 seconds to 1 minute of rest for every 10 meters covered
 - Jumping- Cover as much distance or jump as high as possible
 - Strength Training- Usually around 80% of compound lifts (increases maximal muscle fiber recruitment)

ALACTIC CAPACITY

- Alactic Capacity Intervals (Jamieson) (Aims to increase PC stores)
 - Train maximally for 8-15 seconds with 20-90 seconds of rest, that is one rep. Each workout should have 10-12 reps per set and 3 sets per workout. Add 8-10 minutes of active rest between exercises, 1-2 sessions/week. Each week increase the work interval and decrease the rest interval. Start with 8-10 seconds of work with 60 seconds of rest and slowly progress to 12-14 seconds of work and 30 seconds of rest. Exercises include, squat/ split squat jumps or explosive pushups/ bench press.