

2: Acclimatization to the Heat

Will you be competing in the heat this summer? Are you hoping to do a PB? If you are an endurance athlete this information may help in your preparations.

Acclimatization is physiological and psychological -sport scientists measure the physiological variables and know when their athletes have acclimatized and therefore can expect to achieve maximal performance in the heat. You don't need a rectal thermometer to tell you if you have acclimatized...these guidelines can help you in your quest.

Some points to note:

1. If you are acclimatized you will train & compete at a lower skin and core temperature. Therefore your performance will be higher if you compete in the heat.
2. It takes 6-14 days to acclimatize to the heat (a lot of the physiological changes have happened by 6 days). You must exercise in the heat to acclimatize (read on for guidelines).
3. After you are acclimatized it takes 2-3 weeks to lose the physiological effects if you start training in cooler climates. Maintain these effects by intermittent exposure to the heat.
4. Body fat stores hinder your ability to cool. A muscular person with a good layer of body fat may have the hardest time competing in the heat because their muscles produce heat and their body fat layer traps it!
5. Males and females acclimatize equally. A female's menstrual cycle will affect how females feel competing in the heat because it affects their core temperature. Females may find that some days the heat doesn't affect them, while other days they feel mysteriously hotter - you probably are!!!
6. The external factors affecting thermal balance include:
 - A. Air temperature
 - B. Humidity
 - C. Wind and convection
 - D. Solar radiation. The clothes you wear are important on that hot day!!
7. After 10 days of acclimatization your sweat rate almost doubles!!! You must match this by ensuring that you are well-hydrated.

Training in the heat can be dangerous - it is advisable to consult an appropriate professional before attempting to design your acclimatization plan.

What happens to your body when you become acclimatized to the heat?

Physiological Adaptation	Method of Performance Enhancement
Increase in blood flow to the skin	Transports metabolic heat from your core to the periphery where it can be dispersed
More effective distribution of cardiac output. Increase in blood plasma volume.	Evenly distributes blood between your skin and muscles - you have the oxygen required for muscle contraction as well as blood flow to the skin to aid cooling. Blood pressure stabilizes.
Sweating threshold lowers. Ie. start to sweat earlier.	Aids cooling by evaporation from the skin
Increase in sweat output	Aids cooling by evaporation from the skin
Decrease in salt concentration lost in sweat	Aids cooling by evaporation from the skin

How do you acclimatize?

1. Do some of your training in the heat. Don't do all of it in the heat because your intensity of training will be lower in the heat and therefore you will have lower intensity sessions.
2. Progressively increase your intensity and duration. For example, start at an easy intensity for 15-20 minutes and progress from there. If you wear a heart rate monitor and are starting out it is a good idea to use the same target heart rate on a hot day as you would do on a cool day. Then as you acclimatize you can increase your intensity (and your target heart rate is still the same because you have acclimatized).
3. It takes a minimum of 6 days at approximately 70% VO₂ max intensity (80-85% max Heart rate) for 30 minutes continuous to acclimatize. This type of training is quite intense, so you can also use interval training for a longer time frame to experience acclimatization.

Hydration Tips!

1. Your body can absorb approximately 1 L of fluid per hour.
2. Colder fluids are emptied from the stomach quicker than warm fluids
3. The rate of emptying from your stomach will be higher if it is partially filled with fluids. Often it is recommended to drink approximately 500 ml prior to start of race (so that your stomach is partially full) and topping it off with 200-250 ml every 15 minutes.
4. Concentrated carbohydrate solutions impairs gastric emptying (but will enhance performance in races over an hour, so practice with the beverage mix of your choice before competing).

**There is individual variation with this information, so use these tips as a guideline and practice it before your big performance.*

Information obtained from The American College of Sports Medicine, 2000. & McKardle, Katch & Katch, 1991