



# Exercising in the Heat . . . Part II

## *Or the art of staying alive during summer races*

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In my last column I went over the effects of heat on your exercising body, the potential dangers of it and also gave you a few tips to try to keep its effects at a minimum. I had also mentioned *acclimatizing* to the heat. Let's see how someone can acclimatize and beat the heat!

### Acclimatizing to heat

Acclimatization is both physiological and psychological, meaning that training in the heat will not only make your body undergo some changes in order to adapt to the heat but will also make your mind change its attitude towards heat. A bit like getting into cold water in early summer... you just get used to it!

### What is acclimatization?

What happens to your body when you become acclimatized to the heat? Apart from simply getting *used to it*, let's look at the actual physiological changes that occur.

1. There is an increase of the blood flow to the skin, allowing for transport of metabolic heat from your core to the periphery where it can be evacuated.
2. Your cardiac output (refer to Part I for a definition of Cardiac Output) becomes more effectively distributed and there is an increase in blood plasma volume. This creates a better distribution of blood between your skin and muscles - you now have the oxygen required for demanding muscle contraction as well as blood flow to the skin to aid cooling. Your blood pressure will also stabilize.
3. Your sweating threshold lowers, so that you start to sweat earlier when you exercise. The sweat volume also increases dramatically. These aid cooling your body by evaporating liquid heat from the skin through pores.
4. The salt concentration lost in sweat decreases (your sweat is more diluted). This is very helpful as it preserves electrolytes in the plasma and reduces the risk of dehydration.
5. You sweat *smarter!* Not only you sweat more and less concentrated, but the sweat pattern also changes so that your body uses a better distribution of the sweat on the

skin so that you can cool faster. You begin sweating in places where you have never sweated before!

### Some interesting points

- ▲ Once you become acclimatized, you will train and compete at a lower skin and core temperature. Therefore your performance will be better when you have to compete in the heat.
- ▲ You must exercise in the heat to acclimatize (see lower for guidelines). It takes 6-14 days to acclimatize to the heat (but most of the physiological changes will have happened by day 6).
- ▲ After you are acclimatized, the physiological effects will last 2-3 weeks once you start training in cooler climates again, and then your body will go back to its usual pattern. Nevertheless, you can maintain these effects by creating intermittent exposure to the heat. (See below for heat exposure when you live in a northern country!)
- ▲ After 10 days of acclimatization your sweat rate almost doubles!!! Keep in mind that you must match this loss of fluid and ensure that you are continuously well hydrated.

### Recipe to acclimatization

- ▲ Do *some* of your training in the heat. This means that in warm weather you will do most of your training early in the morning or in the evening when it is cooler, and then throw in some sessions at high noon. If you are trying to prepare for competing in the heat and at home you are in the middle of a cold season, try exercising with extra clothes or do some indoor sessions and crank up the heat (very pleasant by the way!).
- ▲ Don't do all of your training in the heat because your intensity of training will be lower and therefore you will not be able to maintain the same speed and power.
- ▲ Progressively increase your intensity and duration in the heat. For example, start with an easy intensity workout for 15-20 minutes and progress from there. If you wear a heart rate monitor it is a good idea to pay attention



to your heart rate because as you acclimatize you will see that you can increase your intensity and your heart rate will stay the same because you have adapted.

▲ It takes a minimum of 6 days at approximately 70% VO2 max intensity (or approximately 80-85% of your maximal heart rate)

for 30 consecutive minutes to acclimatize. This type of training is quite intense, so if you prefer, you can also use interval training (take breaks) for a longer time frame to experience acclimatization. Example: do 6 repetitions of a 5-minute interval at 85% of your maximal heart rate (or about 70% of your VO2 max) with a 3-minute recovery. Your total workout time will be longer but you will still have achieved the same workload in the heat.

▲ Keep in mind that many factors can affect your thermal balance, so you should avoid combining too many factors all at once (otherwise you could be found unconscious in the forest – they say anyway). Such factors include air temperature (what you read on the thermometer), humidity (in very humid places they will sometimes refer to the *Humidex factor* and give you an adapted outside temperature– but the moister the air, the harder it is to evaporate heat through sweat), wind (be aware of a warm breeze) and solar radiation and convection (water and snow reflect the rays back at you and asphalt absorbs the heat and sends it back to you). So remember, the clothes you are wearing play an important role on that hot day!!

Exercising in the heat is extremely demanding and if you suffer from any cardiac disease, circulation or blood pressure issues, you may want to consult your physician before exercising on hot days.

If you think your body can handle it, remember to still do it with care. Take it slowly at first. The dangers of heat are very serious and should not be undertaken. Life's a sport, drink it up!