

Thermoregulation

Overheating is one of the possible explanations for why Paula Radcliffe dropped out of the 2004 Olympic marathon

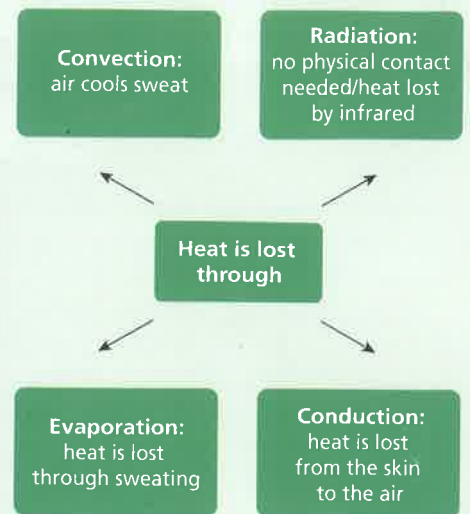


Figure 1 During exercise, sweat evaporation becomes the main cooling mechanism

performer is unable to sweat efficiently and dehydration occurs.

The thermoregulatory centre in the medulla oblongata controls body temperature. Heat is transported to the surface of the skin by the blood. The blood vessels dilate (vasodilation), enabling heat to be lost through radiation, convection, conduction or the evaporation of sweat (Figure 1).

During prolonged exercise or when the body is dehydrated, total blood volume can decrease as more blood is redirected to the skin. This affects performance, as both the volume of blood and the amount of oxygen available to the working muscles are reduced. This situation is exacerbated in hot conditions, so it is important to acclimatise so that the body can modify the control systems that regulate sweating and blood flow to the skin.

Thermoregulation is the ability of an organism to maintain a constant internal body temperature. During exercise, heat is generated in the body as a result of the chemical reactions (metabolic processes) that take place to produce energy.

Long-distance runners can sometimes experience difficulty with temperature regulation. The heat that is produced through muscle contraction raises the core body temperature, which causes blood viscosity to increase and metabolic processes to slow down. This means that the

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