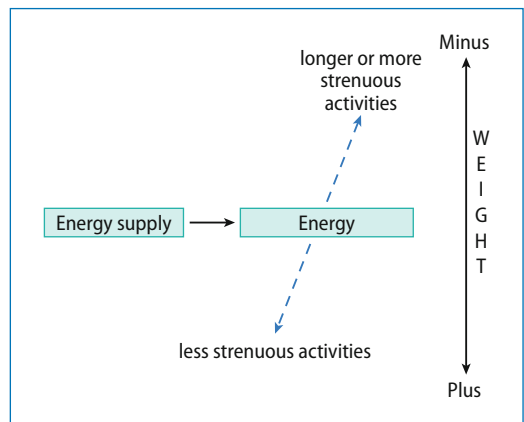


70 The myth of effortless fat burning

The concept of moving extremely slowly to burn off as much fat as possible is a commonly practiced ritual among exercise buffs in fitness studios. But such “fat-burning workouts” do not make good physiological sense because carbohydrate metabolism always takes precedence timewise over fat metabolism. The energy equivalent of fatty acids is responsible for their lower energy flow rate. When considered in relation to one liter of oxygen, the energy yield of **fats** is only **4.7 kcal** – despite their more than twice as high energy value – whereas that of **carbohydrates** is **5.1 kcal**. The nearly 10% higher energy generation from carbohydrates and their faster metabolic pathways during the same oxygen consumption are the reasons why the body gives priority to carbohydrates for its energy metabolism.

The process of energy metabolism is extremely complex indeed. It involves energy-rich phosphates like ATP and creatine phosphate, glucose in the blood, glycogen stores in muscles and liver, free fatty acids, triglycerides in the adipose tissue and, in a subordinate role, amino acids from proteins as well. Due to the energy preference towards carbohydrate metabolism, less-fit individuals in particular will mainly burn up the glycogen reserves in their muscles only. Not until they start more intensive training will their metabolism be improved to the extent that their body is also able to intensely mobilize its fat reserves (► Chapter 68). The optimal regimen for this is physical exercise in the range of 70% of the body’s peak possible performance.



■ Fig. 70.1 Effects of energy metabolism on weight

From the perspective of weight loss, success or failure are dictated entirely by the laws of physics: **the principle of conservation of energy** formulated by Robert Mayer back in 1842. According to this principle, you can only reduce your weight while maintaining the same energy input by increasing your energy output.

The more strenuous physical activity is, the more negative the energy balance and, consequently, the greater the weight loss from fat metabolism.