

Q

If I were stranded in a desert for five days without food or water, what steps would my body take to keep me alive?

Anonymous adult from the U.S.

A

The human body has a remarkable capacity to withstand various stresses, but there are limits to what it can endure. While humans are fairly well equipped to survive prolonged periods without food, dehydration is another matter.

To keep functioning, the body requires energy. Among the most important functions: lungs need energy to facilitate breathing and the heart requires energy to pump blood. The amount of energy—measured in calories—required for the body's vital organs to function is called the basal metabolic rate. It's the number of calories your body would need to stay alive if you slept in bed all day. Any additional physical activity requires additional energy.

The primary form of fuel the body uses is a simple sugar called glucose. Your body breaks down the food you eat into simple molecules, including glucose, that it can use for energy. Excess carbohydrates, beyond what the body immediately needs, are stored in the liver in the form of a molecule called glycogen, which can be broken down into glucose for energy if it is needed later.

A typical person has about one day's worth of energy stored as glycogen, so the first day you were stranded on the desert, your body would deplete your liver's energy store. After using up this supply, the body turns to muscle

and fat for energy. Muscle and fat, depending on how much you have, can allow your body to survive for a few weeks without eating.

The case with water is much different, however. Nearly two-thirds of your body is composed of water, which is necessary for virtually every physiologic process. Every day, the human body loses water—particularly through urine and sweat. Stranded in the desert, you would lose even more water to sweat than usual.

In a state of water deprivation, your body will initially try to hold on to water. Your kidneys will reabsorb it and concentrate your urine. However, if you are unable to find water within a day or so, your body will begin to shut down. Your body temperature will rise as your body is unable to cool itself without sweating. After prolonged dehydration, your blood pressure will drop and your organs will fail due to inadequate blood flow.

All in all, if you were stranded in a desert, my advice would be to first look for some fresh water. If you find it, you will likely have plenty of time to forage or hunt for food.

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