

BEAT THIS HEAT!

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Summer is here. This is a great time for man and dog to sally forth into the great outdoors and commune with nature. Unfortunately, the heat of summer poses risks to all warm-blooded animals. Doing exercise in the heat can increase body temperatures to sometimes dangerous levels, causing illness and even death.

The summer heat can wreak havoc with your system. High temperatures, particularly if you are exercising, can quickly cause hyperthermia - high body temperature. Your body fights to supply blood to the skin and muscles. At the same time, you have to deliver blood to the brain and heart or you will not survive. Unfortunately, you only have a limited blood supply. The problem is made worse by dehydration that occurs quickly during exercise in the heat.

Understanding how your body regulates temperature and protects itself from hyperthermia can help you and your dog prevent heat illness. If you take precautions and stay within your capacity, you can make sure that you and your dog have fun, safe summer outings.

How Dogs and Humans Protect Themselves from the Heat

Environmental scientists call dogs and humans homeotherms because they can maintain constant body temperatures, even in the face of extreme outside temperatures. Snakes and lizards' body temperature changes with the outside temperature - they are called poikilotherms. In people, normal body temperature is approximately 98.6° F. While this temperature varies during the day; it stays relatively constant, regardless of whether it is 50° or 90° outside.

The body's regulates temperature in a part of the brain called the hypothalamus. This brain center has several sensors that are critical for temperature regulation. In humans, the most important center for controlling heat is the sweating center. This center, which stimulates the sweat glands to release sweat, is less important in dogs. Each gram of sweat that evaporates gets rid of half a calorie of heat.

In dogs, the panting center, which stimulates panting, helps the animal get rid of heat. Panting involves rapid shallow breathing that causes evaporation of fluid on the tongue. Dogs have a rich blood supply in their tongues. Heat produced in the dog's muscles and tissues enter the blood and is transported to the tongue, where it is eliminated through panting.

The blood stream is critically important for regulating temperature in both dogs and humans. Water is the most plentiful substance in our bodies. Water is important for temperature control because it can hold a lot of heat; it can also carry heat to the surface via the blood stream.

The spleen is a blood storage organ that helps control heat, particularly during physical activity. When you or your dog exercise, the spleen contract, releasing blood into the blood stream. This blood is then available to help carry excess heat to the surface. Relative to body size, dogs have larger spleens than humans do. The relatively greater release of blood from the spleen during exercise is one reason why dogs usually have better endurance than people.

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You and your dog can keep your internal temperature under control if you follow a few simple principles. Most important among those is to take in enough fluids and don't do too much unaccustomed exercise. Follow the guidelines for preventing heat stress and you and your dog will have safe, fun outings on hot days.

HOW TO PREVENT HEAT STRESS

Follow an aggressive fluid replacement regimen during exercise in the heat. Drink fluids in direct proportion to sweat loss, even during exercise lasting only one hour. Dehydration increases heat storage and reduces the ability to tolerate heat strain. Consuming cold drinks containing moderate amounts of carbohydrate (e.g., "Gatorade") reduces the risk of heat illness and improves exercise performance by preventing dehydration and low blood sugar. Even moderate levels of dehydration (2% of body weight) impairs cardiovascular and temperature regulation and decreases performance. Combining dehydration and high body temperature reduces the capacity of the heart to pump blood, muscle blood flow, skin blood flow and blood pressure.

Adequate hydration during exercise in the heat helps maintain blood pressure and heart pumping capacity, which are essential to adequate skin blood flow and sweat rates. Blood flow to muscles during exercise decreases with dehydration because of reduced blood pressure. Preventing dehydration is a practical way for dogs and humans for preventing heat stress, maintaining exercise performance, and delaying fatigue. Athletes must train themselves to drink larger volumes of fluid more frequently.

You can lessen the risk of heat stress by following a few simple principles:

- Be physically fit! When trying to get into shape, gradually increase the intensity and duration of training in the heat until you and your dog are fully acclimatized. You can best adjust to the heat by exercising above 50% of your maximum capacity. Heart rate is a good measure of exercise intensity.
- Avoid becoming overheated before exercising in a hot environment. Avoid pre-exercise heat exposure.
- Be aware of the early symptoms of heat stress, such as thirst, fatigue, lethargy, and visual disturbances. Clinical signs of hyperthermia are typically more meaningful than temperature measurements. Core temperature is often underestimated because common sites of temperature measurement (i.e., mouth or underarm) often give false readings.
- Don't run or exercise faster than you normally do. If playing tennis or hiking with friends, don't show off by trying to exercise beyond your normal level. This can get you into trouble in a hurry.
- Don't exercise vigorously in the heat if you have recently had any illness accompanied by fever. Other conditions that decrease heat tolerance include sleep loss, sugar depletion in your muscles, liver or blood, or recent heavy alcohol consumption (i.e., "hangover").
- Try to exercise during the cooler times of the day, and don't exercise vigorously if the humidity is high
- Plan for regular fluid breaks. Drink approximately 200 ml (1 cup) of fluid replacement beverage every 15-20 minutes. Supply a drink that's cold (8-13°C) and contains some carbohydrate (6-8 g per 100 ml), with a small amount of electrolyte (sodium and potassium).

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- "Tank-up" before exercise by drinking 600 ml (2.5 cups) of fluid two hours before the activity and an additional 400 ml (1.5 cups) 15 minutes before.
- Fluid replacement should be particularly encouraged during the early stage of exercise. As exercise progresses, blood flow to the spleen decreases, which diminishes water absorption from the gut.
- If exercising regularly in the heat, weigh yourself (and your dog, too) every day. If you lost 2-3 % of body weight, consume extra fluid. If you lost 4-6 %, decrease your exercise intensity. Consult a physician if you lost 7-10% - you might be dangerously dehydrated. People who lose a lot of weight in the heat should be identified and closely monitored.
- Salt tablets are prohibited. However, if you exercise in the heat regularly, you are encouraged to consume ample amounts of salt at mealtime.

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