

No Hot Dogs Please!

by Chris Zink, DVM PhD DACVSMR



How Do Dogs Overheat?

There are just two basic ways your dog can become a hot dog – from external or internal factors.

External. This is the cause of overheating that we think of most often – dogs exposed to high temperatures and/or humidity, such as dogs left in cars or left out in a yard without shade.

Internal. Exercise generates heat. Muscle contraction and movement of the musculoskeletal system produce a tremendous amount of heat! In one study, activity was more important than temperature/humidity in contributing to heatstroke ([references in blog](#)). Of course, if your dog is exercising in hot/humid temperatures, the risk of heat stroke is greatly amplified!

The Discomfort Index

There is a formula that takes temperature and humidity into account and produces a number called the Discomfort Index, or DI. At this link: <https://keisan.casio.com/exec/system/1351058230>, just plug in the current temperature and humidity and it will give you the corresponding DI – pretty cool (or maybe not)! One study showed that dogs are quite comfortable when the DI is less than 22, they are moderately uncomfortable when the DI is 22 to 28 and very uncomfortable when its above 28 ([1](#)).

How Do Dogs Cool?

We all know that the most important cooling system for dogs is evaporation of moisture from the upper respiratory tract – the mouth, nasal passages, pharynx, larynx, etc. ([2](#)). A second way that dogs cool is by dilating the blood vessels under the skin and expelling the heat from the vascular system through the skin.

Why Are Some Dogs More Susceptible to Heat?

1. Genetics. Susceptibility to overheating is partly genetic – a study of elite and poor-performing Alaskan Huskies identified a single region in the genome that was associated with heat tolerance ([3](#)).
2. Physical structure. Physical characteristics are also associated with the ability of dogs to cool. In one study, brachycephalic dogs (dogs with short faces, such as Pugs, Shih Tzu, etc.) were shown to have poorer cooling mechanisms ([4](#)). This is not surprising given that

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brachycephalic breeds have a shorter upper respiratory tract and often have folds of extra tissue in the oropharynx that can interfere with air flow.

3. **Body Condition.** The more surprising result of the above study was that poor body condition (using the Purina BCS measure) was more important than brachycephaly in a dog's inability to cool. The higher the dog's BCS, the warmer they got during exercise and the lower their tidal volume (air flow into the lungs) was. In addition, obese dogs are more likely to die if they do experience heatstroke (1). There's yet another reason to keep your dog fit!

Track Your Dog's Heat Susceptibility

I recommend keeping a record of your dog's heat susceptibility. This is a simple matter of recording the following each time you take your dog outside:

- Dog's Name
- Date and Time
- Temperature, Humidity and DI
- # Minutes of Exercise
- Strenuousness of Exercise (scale of 1 to 3)
- Dog's Distress Level (on scale of 1 to 3, where 1 is slightly panting, 2 is moderate panting, and 3 is panting with the tongue curled).

After a few outings, you'll have a pretty good idea of how much of what type of exercise will be best for your individual dog given the current DI.

What's The Best Way to Cool a Dog?

A recent study compared three mechanisms for cooling dogs after 15 min treadmill exercise in a room at 30 degrees C (86 degrees F) (5). Dogs that were dipped in water for 5 minutes at ambient temperature had cooled in 16 minutes. Dogs that were placed in a kennel on a cooling mat at 4 degrees C (39 degrees F) with a fan took 36 minutes to cool. And dogs that were just in a kennel with a fan took 48 minutes to cool down. The authors suggested that water immersion is a method for not only treating but also for preventing overheating when dogs exercise. Want to know more? We've prepared a 60-minute webinar that answers pretty well every hot (or cool) topic on the subject! Check out our [Keeping Your Dog Cool Webinar](#). Of course, if you are a member of Fit For Life® or Fit To Be Tied®, you get this and lots of other "cool" webinars free! Interested in learning more? Join us today! [Avidog-Zink Fitness Memberships](#)

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