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Dog Tips

Scientists Studied Dog Drool and You Won't Believe What They Found

Surprise! There's far more than what meets the eye in your dog's drool. You may rush to clean it up, but it can give you valuable insight about your pup's health, potential infections, and more. And in case you don't want to officially test this, here are 14 hints of trouble to know.

Reviewed by Dr. Becker

STORY AT-A-GLANCE

- Dog drool (saliva) can reveal information about your canine companion’s stress level
- Researchers studying salivary cortisol (stress hormone) levels in dogs living in varied environments made some surprising discoveries
- One surprise: dogs living in shelters over two weeks showed a drop in cortisol levels, pointing to the possibility of an impaired stress response
- Maladaptive stress reactions are unfortunately common in today's dogs, and it’s important for dog guardians to know the signs to look for
- There are a number of ways you can help alleviate and manage your dog's stress response

Editor's Note: This article is a reprint. It was originally published October 12, 2016.

You've probably never given much thought to your dog's saliva, except to say "Yuk!" as you quickly wipe up after your four-legged dribbler or drooler. But what you might not know is that the content of your dog's saliva can actually provide lots of information about your canine companion's stress level.

Research Team Analyzes Studies on Salivary Cortisol in Dogs

A team of researchers from Penn State and Monash University in Melbourne, Australia, conducted a meta-analysis on salivary cortisol (cortisol is a stress hormone also called the fight-or-flight hormone) in dog drool.[1]

A meta-analysis is essentially a study of existing studies on a specific topic that combines the results of those studies to develop conclusions. The research team collected information from over 30 different scientific studies on canine salivary cortisol in groups of dogs, including:

- Dogs with thunderstorm phobia
- Dogs interacting at the park
- Dog play groups at an animal shelter
- Long- and short-term shelter residents
- Working dogs living in kennels

- Assistance dogs at work
- Healthy dogs at veterinary appointments

Surprising Results

What the researchers discovered was that canine cortisol levels are quite variable. In addition, high levels are not always bad, nor are lower levels always good. As lead researcher Mia Cobb of Monash University explained in an interview with Scientific American:

> *"Although the idea of an easy test for stress and welfare in dogs is incredibly appealing to researchers, working dog industries and pet owners alike, there is no perfect test that gives a magic score to determine good welfare or distress in dogs."*[2]

The researchers were able to pinpoint some interesting factors that influence a dog's salivary cortisol levels. For example:

- Dogs whose humans were present during testing had significantly lower levels than dogs whose owners weren't around
- Intact females had higher salivary cortisol levels than spayed females and both intact and neutered males

A truly surprising finding was that dogs living long-term (over two weeks) in animal shelters had significantly lower levels of salivary cortisol than dogs living in family homes or at working dog facilities.

Since the shelter experience is well known to be highly stressful for most pets, the researchers theorize the lower levels of cortisol point to dysregulation of the stress response — meaning the dogs' ability to respond to stress has become impaired.

This could indicate a "fatigued" hormonal stress response (or "adrenal fatigue") similar to what humans experience during periods of chronic stress or inability to sleep.

Is My Dog Stressed?

If your dog briefly startles at loud sounds or hangs back when approached by a stranger, chances are he's exhibiting a normal, healthy stress response. A short-term reaction to a stressful or unfamiliar event allows your dog to prepare to fight or take flight if necessary.

In the wild, the fight-or-flight response keeps animals alive in the face of threats to their survival. But unfortunately, in today's world, maladaptive stress responses, which can be defined as chronic, long-term anxiety and phobias, are a growing problem for companion dogs.

These fear-based conditions often take the form of **separation anxiety**, storm and/or noise phobia or aggression.

A chronic, prolonged fear response can cause both physical and emotional disease processes that can shorten a dog's life and negatively impact quality of life. Chronic stress can depress your dog's immune system, putting him at higher risk for opportunistic infections.

It can also trigger the development of compulsive behaviors, and alter blood flow to vital organs. Since most of us don't have laboratories in our homes to analyze drool to see if our pets are stressed, it's helpful to know some of the signs of maladaptive doggy stress:

- Crying or whining
- Loss of appetite
- Drooling
- Pacing
- Ears held back
- Panting
- Hiding
- Shaking
- Inappropriate elimination
- Tucking tail
- Lip licking
- Vigilance
- Looking away (from a threat)
- Yawning

3 Options for Dealing with Maladaptive Stress in Your Dog

- **Avoidance —** Helping your dog avoid the trigger(s) of his anxiety or phobia is very important. Unfortunately, it can be difficult to do. For example, most owners of storm-phobic dogs can't simply pick up and move to a location with temperate weather.
- **Desensitization —** Desensitization involves exposing a dog to an anxiety-producing trigger to a level at which the fear response is extinguished.
- **Counterconditioning/behavior modification —** Counterconditioning involves consistently and repeatedly pairing a negative trigger with a positive one, until your dog makes a positive association. For example, if your dog exhibits a fear response each time you turn on the vacuum cleaner, offer him a treat each time you turn it on. The goal is to condition him to associate a treat with the noise of the vacuum cleaner.

Behavior modification can be useful for storm-phobic dogs. Ask your dog to perform a command he's familiar with and reward him if he does. This activity distracts both of you — your dog from his fear of the storm, and you from the temptation to inadvertently reinforce your pet's phobic behavior by petting and soothing him while he's showing anxiety.

Additional Tips

For dogs with separation anxiety:

- Leave your dog with an article of clothing or blanket with your scent on it

- Leave a treat-release toy for your dog to focus on in your absence; place small treats around the house for her to discover, along with her favorite toys
- Add a flower essence blend like Separation Anxiety from Spirit Essences to her drinking water
- Invest in an Adaptil collar or diffuser that emits a calming canine pheromone
- Make sure your dog gets plenty of exercise, playtime, mental stimulation and TLC

For dogs with noise and/or storm phobias or dogs that experience temporary environmental stressors:

- Play calm, soothing music (for example, MusicMyPet.com) before a possible stressor occurs. This may relax your dog, with the added bonus of drowning out distressing noises
- If your dog seems to respond well to pressure applied to her body, there are wraps available (for example, Thundershirt.com) that many pet owners and veterinarians find extremely helpful
- TTouch is a specific massage technique that can help anxious pets
- Consult your holistic veterinarian about homeopathic, TCM (Traditional Chinese Medicine) and Bach Flower Remedies that could be helpful in alleviating your dog's stress
- Place a few drops of the essential oil of lavender on your dog's collar or bedding before a stressor occurs, if possible, or diffuse the oil around your house for an overall calming effect
- Provide an "earthing mat" or grounding pad
- Exercise! Going for a brisk walk before and after stress occurs can help combat the negative physiologic effects of stress-induced hormones
- Calming nutraceuticals and herbs that can be of benefit for stressed dogs include holy basil, l-theanine, rhodiola, ashwagandha, GABA, 5-HTP and chamomile

Sources and References

[1] Domestic Animal Endocrinology, Volume 57, October 2016, Pages 31-42

[2] Scientific American, July 27, 2016