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Colorado State University Study Evaluates Probiotic for Calming Effects in Cats

Q The probiotic *Bifidobacterium longum* BL999 was the focus of a recent feline study conducted at Colorado State University (CSU) in partnership with Purina scientists.¹ What was the purpose of this research?

A The probiotic BL999, which is in Purina® Pro Plan® Veterinary Supplements Calming Care canine probiotic supplement, is indicated for use in helping dogs maintain calm behavior. The purpose of this study was to examine the probiotic's effects in purpose-bred research cats with chronic feline herpesvirus 1 (FHV-1) infection. Our primary hypotheses were that cats supplemented with BL999 would have **higher relaxation scores, lower stress markers and lower clinical scores** for reactivated FHV-1 than cats supplemented with a placebo when placed under mild stress.

Q How was the study conducted?

A To test these hypotheses, a 12-week study was designed using cats with chronic subclinical FHV-1 infection, a common infection of cats in which clinical disease can be exacerbated by stress. We enrolled 24 cats with FHV-1 that were randomly divided into placebo and BL999 groups, and cats were supplemented with either BL999 or a placebo in 15 grams of canned cat food. Because we estimated that it would take up to a maximum of six weeks for cats to reach the maximal benefits from the probiotic, the study was conducted in two phases.

For the first 42 days, the cats were housed by supplement type in two separate group housing rooms with similar enrichment. During the second 42 days using two-week intervals, the cats were twice moved back and forth from the respective group housing room into individual cages for the purpose of inducing mild stress.

During this period, biochemical, clinical and behavioral markers were measured. Cats received their assigned dietary supplement during both phases of the study.

Q What were the study findings¹?

A All cats ate all or a majority of both supplements, and there was no obvious vomiting or diarrhea. We noted statistically significant findings in all three types of markers during the second half of the study, when mild stress was induced.

• **Biochemical changes:** During the stress periods, the cats supplemented with BL999 were significantly less likely to have abnormal serum cortisol concentrations ($P = 0.0059$).

• **Clinical changes:** During the stress periods, the cats supplemented with BL999 were significantly less likely to exhibit sneezing ($p = 0.0001$).

• **Behavioral changes:** During the times cats were housed in cages, those supplemented with BL999 were significantly more likely ($p < 0.0001$) to reach out to the scorers through the cage bars and significantly less likely ($p < 0.0003$) to pace in the cages.

Q What can veterinary practitioners take away from this study?

A The results of the CSU study suggest that BL999, the probiotic in Calming Care, is **well tolerated** by cats, **reduces stress, reduces stress-associated problems** like reactivated FHV-1, and **increases social interactions** between cats and people.

Study results suggest that BL999, the probiotic in Calming Care, is:

- ✓ Well-tolerated by cats
- ✓ Reduces stress
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¹ Davis H, Franco P, Gagné J, et al. Effect of *Bifidobacterium longum* 999 supplementation on stress associated findings in cats with feline herpesvirus 1 infection. ACVIM Forum 2021 Proceedings.

Managing Cats with Anxiety: Owners Recognize Signs, Want Solutions



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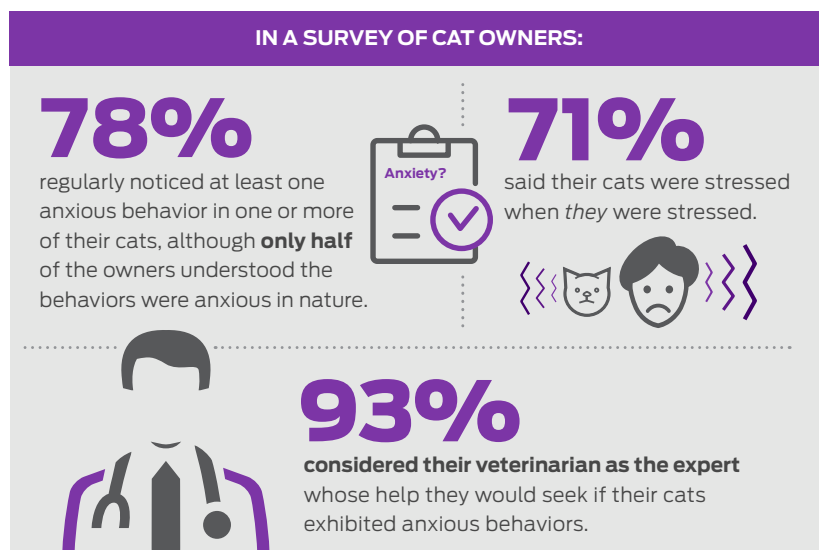
How common are clinical signs of anxiety in cats? Do clients recognize these signs? Are they motivated to consider solutions? Knowing that little data is available regarding the prevalence of anxious behaviors in cats, Purina recently conducted a survey* of more than 1,000 U.S. cat owners to help both veterinarians and owners better understand the problem of feline anxiety and the appeal of strategies to help cats that experience it.

Anxious behaviors are commonly exhibited by cats, but many cat owners didn't connect the triggers with their cats' actions. Of cat owners surveyed:

- Nearly 4 in 5 (78%) regularly noticed at least one anxious behavior in one or more of their cats, although only half of the owners understood the behaviors were anxious in nature.
- One-half (50%) regularly noticed more than one anxious behavior in their cats. The most commonly noticed behaviors were hiding/withdrawing and following household members from room to room.
- Only 2 in 5 (40%) were aware their cats could benefit from assistance.

Owners attributed their cats' anxious behaviors to a variety of potential triggers, including too much or too little environmental change and stimulation. Of cat owners surveyed:

- 1 in 5 (21%) said, "It's just the way my cat is," and 1 in 6 (14%) attributed anxious behaviors to "my cat's curiosity."
- 32% said that boredom/lack of stimulation was a source of anxiety for their cats. Overstimulation—in the form of excessive noise, loud music, over-petting or touching—was cited by 30% as triggering anxiety in their cats.
- 7 in 10 (71%) said their cats were stressed when *they* were stressed.



Many owners were concerned enough to seek solutions for their cats' anxious behaviors, and they overwhelmingly viewed veterinarians as experts. Of cat owners surveyed:

- Nearly one-half (49%) said they have felt motivated to seek help in addressing the behaviors.
- More than 9 in 10 (93%) considered their veterinarian as the expert whose help they would seek if their cats exhibited anxious behaviors.
- Of owners whose cats regularly exhibited one or more anxious behaviors, 43% would consider use of a supplement, 40% would pursue behavior modification therapy and 29% would consider medications.

The bottom line: While there is much owners don't understand about why their cats behave the way they do, it is clear they are concerned about anxious behaviors and open to seeking solutions for their pets.

*Data was collected by Relevation via an online survey utilizing the Prodege panel facility. Qualified participants were adult men and women age 18 or older, owned between one and four adult cats age 1 year or older, were the person in the household most responsible for taking the cat(s) to a veterinarian and took the cat(s) to a veterinarian in the past 12 months. 1,010 nationally representative cat owners qualified and completed the survey. Online data collection was conducted from March 5-9, 2021. The online survey averaged 6 minutes in length.

Feline Anxious Behaviors—A Sign of the Times?

Because of the COVID-19 pandemic, cat ownership is up—and owners and their cats are spending more time together, too. The question of how this will play out if and when owners start spending less time at home remains to be seen.

Between March 2020 and March 2021, more than one-third of surveyed owners reported adopting a cat. Meanwhile, nearly 4 of 5 surveyed owners (78%) responded that they think their cat/s have become more attached to them since they have been at home more, with one-fourth saying they think their cat/s began demonstrating or showing more anxious behaviors because of this increased time together. Nevertheless, more than half of surveyed cat owners (53%) are concerned that their cat/s might display more anxious behaviors if they spend less time at home during the workday in the future.

Understanding and Modifying Anxious Behaviors in Cats



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Q Both dogs and cats experience anxiety, but the triggers and behaviors can differ. What do we need to understand?

A Dogs and cats are wired differently, due to their respective natural and evolutionary histories. Domestic dogs are group animals that evolved in close association with humans, while cats evolved as solitary hunters focused on stalking prey and exploring their environment. As a result, while both dogs and cats can become anxious when they perceive changes in the social dynamic or changes in routine, cats are more highly attuned to changes in their environment—even very subtle ones—and this can sometimes lead to anxiety. Even small changes in the home like rearranging the furniture, redecorating or moving the litter box can cause a cat to experience behavioral swings.

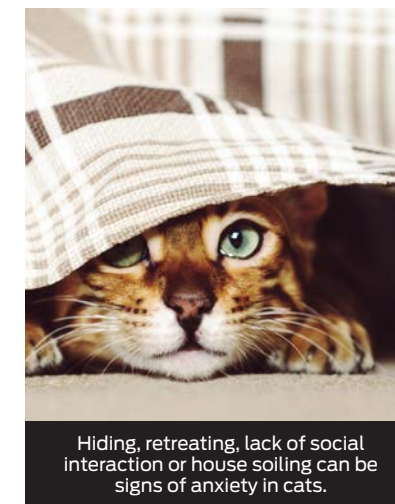
The mistake people sometimes make is assuming dogs are social and cats are not. It's true that cats are more self-sufficient, but they bond closely with humans and feed off or absorb our behaviors. The difference is more one of communication style. Whereas dogs have developed big, gregarious behaviors to tell us about their emotional state, cats are subtle—instead of bouncing around and wagging their tails, they exhibit small movements like whisker flares, twitching the end of their tail or moving their ears. Cats give us all kinds of cues, but people aren't always good at picking up on them.

Q How much of a concern is anxiety in cats? What does anxiety look like?

A Anxiety in cats is quite common but it is severely understudied and underreported. Anxiety can damage the human-animal bond and even lead to relinquishment. Meanwhile, anxiety can lead to compromised immunity, so anxious cats are more susceptible to ailments like upper respiratory infections or digestive upset.

Specific anxious behaviors in cats include the following:

- **House soiling** when the cat has been reliably using the litter box
- **Extreme vigilance** or **unrest**, usually exhibited through excessive pacing and meowing
- **Reluctance to eat and drink**
- **Excessive overgrooming** to the point of pulling out fur
- **Hiding, retreating** and **lack of social interaction**, sometimes manifested as aggression if a cat feels cornered or unable to escape from a stressful situation
- **Changes in posture**, such as lowered stance, pulling ears back or pulling whiskers together instead of fanning them out



Hiding, retreating, lack of social interaction or house soiling can be signs of anxiety in cats.

Q Purina® Pro Plan® Veterinary Supplements Calming Care contains a strain of beneficial bacteria, *Bifidobacterium longum* BL999. We now know that BL999 can help cats maintain calm behavior. How does it work?

A In both dogs and cats, BL999 targets the gut-brain axis. The bacteria is introduced to the gut, where it sends signals through the enteric nervous system to the brain stem via the vagus nerve to alter anxious behavior.

BL999 should be fed daily for at least six weeks. In studies, six weeks is the point where the majority

of subjects experienced behavior changes that were statistically significant, although some dogs and cats respond earlier and some later. The timing is actually very similar to what veterinarians would expect from some anxiolytic medications such as fluoxetine.

It's important to understand that if a pet experiences anxiety, it is part of their underlying temperament and they need to learn skills to cope with stressors that come their way. BL999 is a tool in the toolbox for management of feline patients with anxious behaviors, and cat owners can use it in conjunction with other tools like positive reinforcement, behavior modification or even medication to help address this issue.

Key Takeaways

- A clinical study conducted at Colorado State University determined that cats supplemented with the probiotic BL999 experienced reduced stress, fewer stress-associated problems like reactivated FHV-1 and increased social interactions with people.
- A Purina survey showed that nearly 4 in 5 cat owners surveyed regularly noticed at least one anxious behavior in one or more of their cats, and more than 2 in 5 would consider using a supplement to help manage cats with clinical signs of anxiety.

- The biggest trigger of anxious behavior in cats is change in environment or routine. Even subtle changes in the home like rearranging the furniture, redecorating or moving the litter box can cause a cat to experience behavioral swings.

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WHAT IF...

A PROBIOTIC COULD HELP CATS
WITH ANXIOUS BEHAVIOR?

Cats may be mysterious, but through microbiome research, our network of scientists have discovered how to influence behavior through the gut.

Introducing Purina® Pro Plan® Veterinary Supplements Calming Care with *Bifidobacterium longum* BL999, a probiotic strain shown to help cats maintain calm behavior.



Improvement shown in
cats displaying anxious
behaviors such as pacing



Helps promote positive
behaviors such as playing and
seeking out social contact



Helps blunt cortisol, a marker
of stress, and supports a
healthy immune system

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