



YOU NEED TO CALM DOWN

Therapies for anxiety can vary from diets to probiotics to supplements. Multiple options are available to help each patient achieve the best quality of life possible.



MEET THE AUTHOR

Jessey Scheip, LVT, VTS (Behavior), KPA-CTP
Animal Behavior Wellness Center, Fairfax, Va.

Diets and Dietary Supplements for Anxiety in Dogs

Over the past 100 years, our perception of the emotional needs of dogs has changed significantly. Many of our modern breeds were originally developed as working dogs. They worked alongside their human counterparts in the field, in the barn, or in the factory; and at the end of the day, dogs would eat what they could find. They often subsisted on scraps or leftovers; people thought little about feeding a balanced diet or truly addressing dogs' nutritional needs, focusing simply on the caloric needs.

Jessey earned a degree in Veterinary Technology in 2011. Her medical experience includes general practice, surgical specialty, and emergency/critical care. In 2016 she joined a behavior specialty practice in northern Virginia, now called the Animal Behavior Wellness Center, where she is lead technician and hospital manager. Jessey is also a Veterinary Technician Specialist in Behavior, a Fear Free Elite Certified professional, a Karen Pryor Academy Certified Training Partner, and on the board of directors for the Society of Veterinary Behavior Technicians. Jessey is passionate about the value of behavioral education to ensure the best outcomes for the patient and family.

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Thoughts about nutrition for dogs started to change in the 1860s, when James Spratt, an American entrepreneur, launched the first commercial food item specifically for dogs: the Meat Fibrine Dog Cake, a type of biscuit.¹ Over the next 150 years, pet nutrition continued to evolve. Companies started producing diets to meet the nutritional needs of healthy dogs in various life stages: growth, maintenance, and old age. Next, dog foods were specially formulated to address nutritional needs for disease.

No longer is nutritional management limited to diabetes mellitus or renal insufficiency; it now also addresses emotional disorders such as anxiety. A variety of nutritional compounds and supplements that help improve emotional stability in companion animals have been identified. In addition, along with the nutritional component, movements such as Fear Free (fearfreepets.com) and Low Stress Handling (lowstresshandling.com) have brought the effects of stress on physical health to the forefront of veterinary care.

DETECTING STRESS IN DOGS

The veterinary nurse must be able to recognize patients' behaviors associated with stress and anxiety as well as emotional wellbeing (**TABLE 1**). The easiest way to determine the various manifestations of stress is to consider what a happy dog looks like. Dogs experiencing little to no stress are mildly to moderately sociable with humans and other dogs. Their bodies are loose and relaxed. If the tail is wagging, it is at a moderate speed and held roughly at mid-level, in line with the spine.² These dogs will approach novelty with curiosity, investigating it without startling or by moving quietly toward the stimulus. Comfortable dogs may or may not request physical affection by nudging a person's hand with the nose, leaning into the person, or turning so their hind end is toward the person.

Brain health begins long before anxiety can be manifested, even before birth. At the time of conception, the nutrition of the dam will affect the brain health of the fetus.⁴

Amounts of stress can vary across a spectrum. Small amounts of stress are normal and good for the dog. A play session, for example, will induce a type of stress.³ However, behavior of an overly stressed dog would deviate from that of a contented dog.⁴ Most often, anxious dogs pant frequently; seem to have difficulty resting and relaxing, especially in novel situations; and even within their own home, anxious dogs may vocalize, avoid strangers, have difficulty resting, or display various levels of reactivity and aggression.⁴

Some dogs may display happy, contented behavior in most situations but stress behavior only in specific situations. Other dogs demonstrate some level of anxiety regardless of their environment.³ Diets and supplements can likewise be used situationally, or they can be used routinely to help manage the dog's overall brain health and emotional wellbeing.

ROLE OF NUTRITION IN BRAIN HEALTH

Brain health begins long before anxiety can be manifested, even before birth. At the time of conception, the nutrition of the dam will affect the brain health of the fetus.⁴ After birth, structural development of the brain, cognition, and normal

TABLE 1 Indications of Emotional State in Dogs

BODY PART	CONTENT	STRESSED
Ears	Held softly forward or laterally	Held back or tensely pulled forward
Eyes	Observant, minimal sclera visible, occasional squinting	Dilated pupils, sclera clearly visible, staring, heavy squinting
Mouth	Closed or lightly panting	Panting, lip licking, heavy wrinkling around mouth commissure
Tail	Mid-level, moderate wag	Tucked or high flagging, quick and narrow wag
Weight distribution	Evenly over all 4 limbs	Intently leaning forward or away from a stimulus



GLOSSARY

α -lactalbumin A protein with a high tryptophan content, found in the milk of mammals

C3 Colostrum Calming Complex A mixture of bioactive proteins produced from certified bovine colostrum

Carotenoids Pigments from plants and algae, with antioxidant properties

Casozepine A bioactive peptide derived from milk protein

DHA Docosahexaenoic acid, a long-chain omega-3 fatty acid

EPA Eicosapentaenoic acid, a long-chain omega-3 fatty acid

Flavonoids Plant chemicals with antioxidant properties

L-Carnitine A naturally occurring amino acid derivative that transports fatty acids

L-Theanine An amino acid found in green tea

M officinalis *Magnolia officinalis*, a magnolia tree from which bark extracts are used

MCTs Medium-chain triglycerides (fatty acids) derived from botanical oils

P amurense *Phellodendron amurense*, the Amur cork tree, from which fruit and bark extracts are used

SAMe S-adenosylmethionine, the bioactive form of methionine, an essential amino acid

Silybin The most active component of silymarin, which is derived from milk thistle; also known as silibinin

Tryptophan An essential amino acid and serotonin precursor

responses to the environment depend on access to proper levels of carbohydrates, proteins, and fats.

Carbohydrates

Carbohydrates are the primary energy source for the mammalian cell, but they also affect the function of the hypothalamic-pituitary-adrenal (HPA) axis. This axis is responsible for an animal's successful and appropriate response to stressors.³ Too little of an HPA axis response and the animal cannot adapt appropriately; too great an HPA axis response and the animal's response is exaggerated.

Proteins

Proteins are organic molecules used primarily for structural development. The building blocks of proteins are amino acids. The animal's genetic structure provides the programming needed for amino acids to be linked and formed into proteins, which are then used to build the structures of the body and brain.

Fats

Fats are critical for spinal cord myelination. Myelination is the developmental process by which each neuron is coated in a fatty structure, called myelin.³ It is this structure that enables the nervous system to effectively and quickly communicate with the rest of the body. In altricial (hatched or born in an undeveloped state and requiring care and feeding by the parents) species such as dogs and cats, myelination occurs after birth, which is why altricial animals cannot walk until they reach the transition stage of development (around 2 to 3 weeks of age).⁴

NUTRITIONAL SUPPLEMENTS FOR BRAIN HEALTH

Essential Fatty Acids

Beyond the role of fat during development, essential fatty acids (EFAs) also help manage anxiety. EFAs are fats that cannot be produced by the body; they must be consumed. They comprise linoleic acid (an omega-6 fatty acid) and α -linoleic acid (an omega-3 fatty acid).⁵ EFAs have a variety of roles within the body, including mood, behavior, and inflammation. Because of their effects on brain health and other body systems, nutritional supplementation with EFAs is often used to assist dogs experiencing dementia or other signs of cognitive dysfunction.⁴

Proteinaceous Compounds

L-Tryptophan

Certain proteinous compounds have been found to help reduce, manage, and to some degree treat anxiety in companion animals. L-Tryptophan is an essential amino acid that is commonly associated with the consumption of turkey meat. L-Tryptophan plays a role in synthesis of serotonin.⁴



Serotonin

Serotonin is a neurotransmitter associated with mood stabilization, sleep cycles, and decision making.³ Serotonin is the neurotransmitter that is primarily targeted by psychotropics used to treat behavior disorders.⁴

5-Hydroxytryptophan

Another product, 5-hydroxytryptophan (5-HTP), is the intermediate metabolite produced during the body's synthesis of serotonin from L-tryptophan.³ It has been used to regulate sleep, depression, anxiety, aggression, and even pain.³ Studies in canids have been limited, and some have indicated the potential for 5-HTP

toxicity when overdosed. One retrospective study, conducted by the American Society for the Prevention of Cruelty to Animals Animal Poison Control Center, identified 21 cases of accidental ingestion of 5-HTP by dogs, of which 19 dogs were symptomatic and 3 died.⁶

L-Theanine

A safer alternative to 5-HTP is L-theanine. This amino acid can be used to help stabilize mood and has far less risk for toxicity or adverse reactions than 5-HTP.⁶ L-Theanine is most frequently found in the plant used to make green tea (*Camellia sinensis*), which has long been consumed for its calming properties. Studies have shown that L-theanine binds the receptors of glutamate,

TABLE 2 Examples of Diets and Supplements for Minimizing Anxiety in Dogs

PRODUCT	ACTIVE INGREDIENT	BEHAVIORAL CONDITION(S) ASSESSED IN STUDIES
Anxitane	● L-Theanine	Anxiety, noise and storm phobias, fear of unfamiliar humans
Composure	● Thiamine ● C3 Colostrum Calming Complex ● L-Theanine	Various anxieties, noise and storm anxiety
Composure Pro	● Thiamine ● C3 Colostrum Calming Complex ● L-Theanine (higher levels than in Composure)	No published research
Denamarin Advanced	● SAMe ● Silybin	No specific product studies conducted
Hill's Prescription Diet c/d Multicare Feline Stress	● α-casozepine ● L-Tryptophan ● DHA ● EPA ● Antioxidants	Feline idiopathic cystitis
Hill's Prescription Diet b/d Brain Aging Care	● DHA ● EPA ● L-Carnitine ● Lipoic acid ● Vitamins C, E ● Carotenoids ● Flavonoids	Cognitive dysfunction, sociability (older dogs)
Purina Pro Plan Veterinary Diet NeuroCare	● MCTs ● Arginine ● DHA ● EPA ● Vitamins B ₆ , B ₉ , C, E	Disorientation, sleep-wake cycle, social interactions, anxiety, and activity levels
Royal Canin Veterinary Diet Calm	● α-casozepine ● L-Tryptophan ● DHA ● EPA	Anxiety-associated behaviors
Solliquin	● L-Theanine ● <i>M officinalis</i> ● <i>P amurensis</i> ● α-lactalbumin	Fear, anxiety, storm/noise-induced anxiety
Zylkene	● α-casozepine	Social phobia, anxiety

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“Stress colitis” is the term used for acute diarrhea associated with stressful situations in animals, such as boarding or travel.



which is the brain’s primary excitatory transmitter.⁷ By occupying those receptors, L-theanine can help prevent overexcitement and, therefore, anxiety.⁷

α -Casozepine

Another noteworthy peptide is α -casozepine, which is a bioactive peptide originating from a S1 casein, a protein in cow’s milk. Various studies have shown that this product effectively decreases anxiety in cats,⁸ but its anti-anxiety effects in dogs are comparable to those of the pharmaceutical selegiline.⁹ α -casozepine is structurally similar to γ -aminobutyric acid, an amino acid that functions as an inhibitory (calming) neurotransmitter in the brain.

Probiotics

Beyond standard nutrients, veterinary medicine has begun focusing on the effects of probiotics on anxiety. “Stress colitis” is the term used for acute diarrhea associated with stressful situations in animals, such as boarding or travel. During an acute stress response, the body produces corticotropin-releasing factor, which mediates the HPA axis.³ Corticotropin-releasing factor binds to receptors in the gastrointestinal (GI) tract, leading to diarrhea. Chronic stress and activation of the HPA axis can increase the permeability of the GI tract, making the animal more susceptible to disease and other inflammatory processes.¹⁰ The brain and GI tract are very closely linked. Armed with this knowledge, researchers have explored ways to reduce the effects of stress by supporting the GI tract. One of the most common supportive products is the probiotic.

A probiotic is a type of supplement that contains strains of bacteria that are considered beneficial to GI health.¹⁰ For years, *Enterococcus faecium* has been the ingredient of probiotics for dogs, but a new species has recently come under scrutiny: *Bifidobacterium longum* (BL999). In a study conducted in 2008, consumption of these

bacteria was shown to reduce GI symptoms associated with stress in humans;¹¹ a newer study has shown that dogs experience similar relief.¹² The veterinary community has since picked up on this research and started marketing new types of probiotics for dogs and cats, primarily to reduce the effects of anxiety.

PRODUCTS AVAILABLE

So far, this article has explored individual compounds. Although it is possible to supplement with each sole ingredient, many companies have created accessible and easy-to-administer products that may include not just one but several active ingredients (TABLE 2).

CONCLUSION

Cognitive, behavioral, and emotional pathologies of companion animals are garnering attention in the research and clinical realms. Therapies for anxiety can vary from appropriate diets to probiotics to supplements. Every animal is different; fortunately, multiple options are available to help each patient achieve the best quality of life possible. **TVN**

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