

# Emotional Balance: Supporting the Stress Response Pathway in Companion Animals

Developed and reviewed by the members of the Standard Process Veterinary team

## Stress Response Health and Function

The stress response is adaptive and essential for dogs' and cats' survival. It is mediated via an interplay of endocrine, nervous system, and immune mechanisms that occur in response to stressful stimuli. Research has demonstrated that physiological pathways associated with fear, anxiety, and stress are mediated by a variety of neurotransmitters as well as hormones and other molecules. It is suggested that these avenues of modulation provide opportunities to assist in the alleviation of fear, anxiety, and stress, improving the quality of life for suffering animals (including cats and dogs) and their pet parents.

## Key Considerations

The endocannabinoid system (ECS) plays a key role in regulating fear and anxiety in dogs and cats. The ECS is a complex signaling system consisting of endocannabinoids (anandamide and 2-AG), cannabinoid receptors (CB1 and CB2), and enzymes that synthesize and break down these molecules.<sup>1</sup> The ECS plays a significant role in modulating fear and anxiety through its components that influence the hypothalamic-pituitary-adrenal (HPA) axis.

### 1. CB1 Receptors in the Brain

- CB1 receptors are abundant in the amygdala, prefrontal cortex, and hippocampus, all of which are involved in fear processing and emotional regulation.
- Activation of CB1 receptors reduces excessive excitatory signaling in fear circuits, helping to regulate stress responses and fear extinction (the ability to “unlearn” a fearful association).<sup>2</sup>

### 2. CB2 Receptors and Inflammation

- CB2 receptors are mainly found in immune cells and may play a role in neuroinflammation, which is linked to stress and anxiety disorders.
- Modulating CB2 activity may help reduce chronic stress-induced inflammation and improve emotional well-being.<sup>3</sup>

### 3. Endocannabinoids and the Hypothalamic-Pituitary-Adrenal (HPA) Axis

- The ECS helps regulate the HPA axis, which controls the body's response to stress.
- By maintaining balance, endocannabinoids prevent excessive cortisol release, which is associated with chronic anxiety.<sup>4</sup>

Additionally, the relationship between glutamate and the adrenal glands in fear and anxiety responses in dogs and cats involves complex interactions within the hypothalamic-pituitary-adrenal (HPA) axis.

#### 1. Glutamate's Role in HPA Axis Activation:

- Glutamate stimulates the hypothalamus to release corticotropin-releasing hormone (CRH).
- CRH prompts the pituitary gland to secrete adrenocorticotrophic hormone (ACTH).
- ACTH then signals the adrenal glands to produce cortisol, a primary stress hormone.

#### 2. Impact of Excessive Glutamate:

- Overactivation of glutamate receptors can lead to heightened and prolonged HPA axis activity.
- This may result in elevated cortisol levels, contributing to chronic stress and anxiety-related behaviors in pets.

Understanding the interplay between glutamate signaling and adrenal gland function is crucial for developing effective strategies to manage fear and anxiety in dogs and cats. By addressing both neurotransmitter activity and hormonal responses, a more comprehensive approach to treatment can be achieved.

## A Multimodal Approach to Supporting Emotional Balance

Of particular interest for their physiological effects on fear, anxiety, and stress are the neurotransmitters glutamate and GABA, the amino acids L-theanine and L-tryptophan, the essential mineral magnesium, and the herb ashwagandha. Noted is the importance of filling nutritional gaps with attention to a diet that stresses a whole food-based approach to nutrition.

# Adjunctive Supplement Support



## FEATURED PRODUCT

### Calming Comfort Pro

Suggested Use: **See product label for dosing by weight**

- Contains a blend of amino acids that interact with calming neurotransmitter pathways
- Promotes a calm demeanor and normal stress response
- Supports neurotransmitter synthesis for behavioral health
- Beneficial for animals in stressful situations like thunderstorms, fireworks, travel, veterinary visits and separation



### Canine & Feline Whole Body Support

Suggested Use: **See product labels for dosing by weight**

- General multisystem support for daily maintenance of all dogs' and cats' body systems
- Supplements like Canine and Feline Whole Body Support, made from whole foods, organ and tissue extracts, botanicals, and other ingredients, can fill nutrition gaps.



### Canine Adrenal Support

Suggested Use: **See product label for dosing by weight**

An adrenal support supplement for dogs that supports their adrenal glands' ability to rebuild, regenerate, and respond normally to stress.



### VF Hemp Oil

Suggested Use: **See product label for dosing by weight**

An organic liquid hemp supplement for cats and dogs designed to support pets' endocannabinoid systems (ECS) with 15 mg phytocannabinoids per 1ml.



### Orchex®

Suggested Use: **Dosing by weight\*\***

- Combines nutrients to promote nervous system balance
- Caution: Not to be given regularly, acute use only. Can use for a maximum of 3 days consecutively with a minimum of 2 weeks in between bouts of use.†

## Multimodal Approach to Emotional Balance | In Office Exam

- Address diet. Species appropriate, fresh food is best.
- Include key nutrients shown to support emotional balance such as GABA, L-theanine, L-tryptophan, and magnesium.
- Incorporate behavior modification techniques such as desensitization, positive reinforcement, and clicker training.
- Consult with a veterinary behaviorist for additional tools for pet parents.

## REFERENCES

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3. Morcuende, A., García-Gutiérrez, M. S., Tambaro, S., Nieto, E., Manzanares, J., & Femenia, T. (2022). Frontiers in Psychiatry, 13.
4. Ahmadiipour, A. et al. (2024). In: Gargiulo, P.A., Mesones-Arroyo, H.L. (eds) Psychiatry and Neuroscience Update – Vol. V. Springer, Cham.