



Q&A: EMERGING TOPICS

Integrating Veterinary Supplements and Nutraceuticals Into Traditional Approaches

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Abstract

Veterinary supplements and nutraceutical products are regulated differently than pharmaceutical drugs. Despite research not being legally required, a number of safety and efficacy studies of the ingredients in these products have been performed on various animal species. This article discusses what veterinary supplements and nutraceuticals are, the species in which these ingredients have been studied, how to choose safe and effective veterinary supplements and nutraceutical products as part of a multimodal veterinary medical plan, how some common veterinary supplement and nutraceutical ingredients can support patients, and the role veterinary team members play in integrating these products into traditional approaches to care.



Take-Home Points

- Veterinary supplements and nutraceuticals can be used alongside traditional veterinary medicine practices to provide a multimodal approach to care.
- Veterinary supplements and nutraceuticals can help support a variety of body systems.
- By providing viable veterinary supplement and nutraceutical product recommendations, veterinary team members can influence where and how clients complete research and increase trust.
- The U.S. Food and Drug Administration (FDA) does not regulate veterinary supplements and nutraceutical products the same way it regulates pharmaceutical drugs; therefore, it is helpful for veterinary team members to be able to guide clients in their selection of safe and effective products for their pets.
- Species-specific scientific evidence of ingredient efficacy and safety exists for some veterinary supplements and nutraceutical products.
- In the United States, veterinary supplements and nutraceuticals cannot legally claim to treat, cure, prevent, or mitigate disease; only FDA-approved pharmaceutical drugs can use these claims.

The terms “supplements” and “nutraceuticals” can be easily confused with each other and are often used interchangeably colloquially, but there are differences. To further complicate matters, not all descriptors are appropriate to use with the term “supplement” when referring to animal products. According to the U.S. Food and Drug Administration (FDA) Dietary Supplement Health and Education Act of 1994, the phrase “dietary supplement” can only be used to refer to products taken by humans that are designed to supplement a diet by increasing the daily intake of those compounds.¹ Because of this, a variety of terms including “veterinary supplement,” “veterinary health supplement,” “animal health product,” “veterinary nutritional supplement,” “pet supplement,” and other variations of these phrases are commonly used to refer to similar products that are intended for this same use in animals.

Stephen DeFelice created the word “nutraceutical” in 1989 by combining the words “nutrition” and “pharmaceutical.”² Because it has various industry definitions and is not defined by the FDA, the word “nutraceutical” can be used to refer to products for both humans and animals. DeFelice defined a nutraceutical as a “food or part of food that provides medical or health benefits, including the prevention and/or treatment of a disease,” despite the FDA defining only a pharmaceutical drug as “a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease” and as “a substance (other than food) intended to affect the structure or any function of the body.”³ The now-defunct North American Veterinary Nutraceutical Council defined

nutraceutical as “a [non-drug] substance which is produced in a purified or extracted form and administered orally to a patient to provide agents required for normal body structure and function and administered with the intent of improving the health and wellbeing of animals.”^{1,3}

Despite the lack of regulations in the United States, veterinary supplements and nutraceuticals have risen in popularity over the years. If pet owners aren’t already giving their pets products with these ingredients, they may be familiar with them because they take similar human products themselves, have seen the variety of products available to their pets through pet retailer marketing, or have been looking for alternative or complementary options to pharmaceutical and other traditional veterinary treatments and preventive medicine.⁴ Not all veterinary supplement and nutraceutical products are equally safe or effective, though; therefore, veterinary team members should be



... veterinary team members should be comfortable discussing options with clients to integrate or expand their hospital’s traditional care approaches.^{1,2}



comfortable discussing options with clients to integrate or expand their hospital's traditional care approaches.^{1,2}

What animal species and body systems can be supported with veterinary supplements and nutraceuticals?

Based on scientific studies, several body systems may be supported by veterinary supplements and nutraceuticals (**TABLE 1**).

In addition to efficacy studies, it is ideal to have species-specific studies for pet supplements and nutraceuticals to help ensure bioavailability and safety in a specific animal species. See **TABLE 2** for specific species and the veterinary supplement or nutraceutical ingredients that have been studied in them.

Veterinary supplements and nutraceuticals can be incorporated into a multimodal treatment plan or used alone. A variety of examples of sound recommendations

exist for common cases. Based on the aforementioned research, these examples include glucosamine hydrochloride and sodium chondroitin sulfate—containing products for dogs, cats, horses, and rabbits that are prone to developing or already have joint issues and L-theanine—containing products for dogs and cats that are anxious when they hear fireworks or thunder. Additionally, dogs, cats, and horses with itchy and dry skin may benefit from fish oil products that contain omega-3 fatty acids, and dogs and cats with elevated alanine aminotransferase enzyme levels are likely to benefit from S-adenosylmethionine and silybin supplementation to help support their livers.

Is there variability in veterinary supplement and nutraceutical products?

Supplement and nutraceutical raw ingredients can be researched for bioavailability, safety, and efficacy in specific species; however, when those ingredients are put into a finished pet product, other aspects, such as

**TABLE 1 Veterinary Supplements/
Nutraceuticals by Body System They Support**

BODY SYSTEM	VETERINARY SUPPLEMENT/ NUTRACEUTICAL INGREDIENT
Brain	• L-Theanine^{5,6} • Probiotics⁷ • S-Adenosylmethionine (SAME)⁸
Digestive	• Cobalamin^{9,10} • Pancreatic enzymes¹¹ • Probiotics^{7,12}
Gingival	• β-Glucans¹³
Cardiovascular	• Omega-3 fatty acids¹⁴
Immune	• β-Glucans¹⁵⁻¹⁷
Joint	• Avocado-soybean unsaponifiables (ASU)¹⁸ • β-Glucans¹⁹ • Eggshell membrane²⁰ • Glucosamine hydrochloride^{18,21} • Omega-3 fatty acids^{22,23} • Sodium chondroitin sulfate^{21,24} • Undenatured type II collagen (UC-II)²⁵
Liver	• SAME^{26,27} • Silybin^{27,28}
Renal	• A2-type proanthocyanidins²⁹ • Omega-3 fatty acids³⁰ • Probiotics³¹
Skin/coat	• β-Glucans³² • Hardy kiwi³³ • Omega-3 fatty acids³⁴ • Probiotics³⁵

**TABLE 2 Veterinary Supplements/
Nutraceutical Ingredients by Studied Species**

SPECIES	VETERINARY SUPPLEMENT/ NUTRACEUTICAL INGREDIENT
Canine	• A2-type proanthocyanidins²⁹ • β-Glucans^{2,13,16,32} • Cobalamin¹⁰ • Eggshell membrane¹⁹ • Glucosamine hydrochloride^{21,24} • Hardy kiwi³³ • L-Theanine⁵ • Omega-3 fatty acids^{14,22,30,34} • Pancreatic enzymes¹¹ • Probiotics^{12,35} • S-Adenosylmethionine (SAME)²⁶ • Silybin²⁷ • Sodium chondroitin sulfate^{21,24} • Undenatured type II collagen (UC-II)²⁵
Feline	• β-Glucans¹³ • Cobalamin⁹ • Glucosamine hydrochloride²¹ • L-Theanine⁶ • Omega-3 fatty acids²³ • Pancreatic enzymes³⁶ • Probiotics^{31,37} • SAME⁸ • Silybin²⁸ • Sodium chondroitin sulfate²¹
Equine	• Avocado-soybean unsaponifiables (ASU)¹⁸ • Glucosamine hydrochloride²¹ • Sodium chondroitin sulfate²¹ • Omega-3 fatty acids³⁸
Leporine	• Glucosamine hydrochloride²¹ • Sodium chondroitin sulfate²¹



label claims, contaminants, purity, and shelf life, also need to be considered. The pharmaceutical drug manufacturing process is strictly regulated by the FDA, so when a consumer purchases an FDA-approved pharmaceutical drug, it automatically includes all the benefits of having gone through the FDA 12-step drug approval process.³⁹ This process includes:

- Research and testing in the species for which the drug is manufactured
- Determination of effective dosages derived from that research
- Addressing any side effects or safety concerns
- Analyzing the finished product for purity and contaminants
- Monitoring to ensure the amount of an ingredient that is stated on the label is factual

Because veterinary supplement and nutraceutical products are not pharmaceutical drugs, these steps are not required to be completed before a product is sold to pet owners. This means that there are no legal requirements for veterinary supplement and nutraceutical manufacturers to obtain or provide the information that would otherwise be discovered during the FDA drug approval process. This can be surprising to pet owners, who may assume and trust a product that often looks like a pharmaceutical drug and claims it will help their pet. Despite the lack of regulation in the U.S. veterinary supplement and nutraceutical industry, some manufacturers not only use ingredients that have been researched but also take voluntary steps to help ensure their finished products are shelf stable, pure, and free of contaminants and meet label claims.

Membership with the National Animal Supplement Council (NASC) is an option that veterinary supplement and nutraceutical manufacturers have to help ensure trust in their products. The NASC is a nonprofit trade association that requires its members to “pass a comprehensive third-party quality audit every 2 years, maintain ongoing compliance with rigorous NASC quality standards, participate in annual continuing education facilitated by NASC, and pass random independent testing of their products to ensure they are meeting label claims.” In return, NASC members earn permission to display the NASC Quality Seal on their veterinary supplement and nutraceutical product packaging.⁴⁰ Veterinary team members can look for the NASC Quality Seal when making veterinary supplement and nutraceutical product recommendations.



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ConsumerLab (consumerlab.com) is an independent laboratory that tests human and veterinary supplements and nutraceuticals. This laboratory purchases its tested products independently from pet retailers and does not accept product samples from manufacturers. It provides transparency on its testing methods and verifies the identity, strength, purity, and disintegration of tested products. ConsumerLab publishes test results on its website, along with brand recommendations based on test findings.^{41,42} Veterinary team members can use this third-party laboratory to help determine which veterinary supplement and nutraceutical products are free of contaminants and meet label claims.

Checking if a manufacturer has Good Manufacturing Practice (GMP) certification is yet another way to help determine the quality of veterinary supplements and nutraceuticals. These certifications are granted by authorized third parties to manufacturing facilities that are compliant with FDA Current Good Manufacturing Practice regulations. Certification typically lasts for 3 years and involves an analysis of quality and computer systems, an analysis of the manufacturing facility, and a review of equipment logs and personnel. GMP certification is part of the FDA drug approval process to ensure products are manufactured consistently and to minimize errors and contamination, but manufacturers that don't produce drugs can also become GMP certified.^{43,44} Veterinary team members can contact veterinary supplement and nutraceutical manufacturers directly or check company websites to determine whether they are GMP certified.

Why should veterinary professionals be well versed in veterinary supplements and nutraceuticals?

Only safe and effective veterinary supplement and nutraceutical products should be recommended to clients; therefore, it is important for veterinary team



members to know how to determine which products fulfill these requirements. Clients may be unaware of the lack of regulation in the veterinary supplement and nutraceutical industry and therefore will benefit from guidance from the veterinary team. Proactive guidance can help prevent ineffective (due to a lack of bioavailability, purity, or efficacy) or even harmful (due to contaminants or a lack of safety studies) products from being administered to patients. **TVN**

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Zenalpha® (medetomidine and vatinoxan hydrochlorides injection) Sedative, Analgesic For Use in Dogs Only

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

BRIEF SUMMARY: (for full prescribing information, see package insert)

DESCRIPTION: Zenalpha is a combination of medetomidine and vatinoxan hydrochlorides. Each mL of Zenalpha contains 0.5 mg medetomidine hydrochloride, 10 mg vatinoxan hydrochloride, 32.5 mg mannitol (USP), 4.16 mg citric acid monohydrate (USP), 1.8 mg methylparaben (NF), 0.2 mg propylparaben (NF).

INDICATION: Zenalpha is indicated for use as a sedative and analgesic in dogs to facilitate clinical examination, clinical procedures and minor surgical procedures.

CONTRAINDICATIONS: Do not use Zenalpha in dogs with cardiac disease, respiratory disorders, shock, severe debilitation, that have hypoglycemia or are at risk of developing hypoglycemia, or are stressed due to extreme heat, cold or fatigue.

Zenalpha is contraindicated in dogs with a known sensitivity to medetomidine or vatinoxan.

WARNINGS:

Human User Safety Warnings

Not for use in humans. Keep this and all medications out of reach of children and pets.

Avoid skin, eye or mucosal contact. Use caution while handling and using filled syringes. Absorption of the active ingredients is possible following exposure via the skin, eye or mucosa. In case of accidental eye exposure, flush eyes with water for 15 minutes, remove contact lenses then continue to flush. In case of accidental skin exposure, wash with soap and water and remove contaminated clothing. If symptoms occur, seek the advice of a physician.

In case of accidental oral intake or self-injection, seek medical advice immediately and show the package insert to the physician. DO NOT DRIVE as sedation, loss of consciousness, and changes in blood pressure may occur.

Persons with cardiovascular disease (for example, hypertension or ischemic heart disease) should take special precautions to avoid any exposure to this product.

Pregnant women should exercise special caution to avoid exposure. Uterine contractions and decreased fetal blood pressure may occur after accidental systemic exposure.

Persons with known hypersensitivity to any of the ingredients should avoid contact with Zenalpha.

Caution should be exercised when handling sedated animals. Handling or any other sudden stimuli, including noise, may cause a defense reaction in an animal that appears to be heavily sedated.

Note to physician: Zenalpha contains medetomidine, an alpha₂-adrenoceptor agonist, in combination with vatinoxan, a peripherally selective alpha₁-adrenoceptor antagonist. Symptoms after absorption or accidental self-injection may include dose-dependent sedation, respiratory depression, bradycardia, tachycardia, and hypotension.

Animal Safety Warnings

Zenalpha should not be administered in the presence of pre-existing hypotension, hypoxia or bradycardia. Due to the pronounced cardiovascular effects of alpha₂-adrenoceptor agonists, only clinically healthy dogs (American Society of Anesthesiologists (ASA) classes I and II) should be administered Zenalpha. Dogs should be monitored frequently for cardiovascular function and body temperature during sedation.

Zenalpha is not intended for use in cats. The use of Zenalpha in cats has been associated with hypotension.

PRECAUTIONS: Dogs should be monitored frequently during sedation for changes in heart rate, blood pressure, respiratory rate and body temperature. Tachycardia may occur in some dogs after recovery from sedation.

In the event of hypoxia or apnea, supplemental oxygen should be administered.

Following administration of Zenalpha, a decrease in body temperature may occur and an external heat source may be needed to maintain body temperature. Hypothermia may persist longer than sedation and analgesia.

The analgesic effect of Zenalpha will not last longer than the sedative effects. Additional analgesic(s) should be administered as needed.

Nervous, excited or agitated dogs with high levels of endogenous catecholamines may exhibit a reduced pharmacological response to Zenalpha (ineffectiveness). The onset of sedative/analgesic effects could be slowed, or the depth and duration of effects could be diminished or nonexistent. Therefore, allow the dog to rest quietly for 10 to 15 minutes after injection.

With the alpha₂-adrenoceptor agonist drug class, including Zenalpha, the potential for isolated cases of hypersensitivity, including paradoxical response (excitation) exists.

Repeat dosing with Zenalpha has not been evaluated.

Zenalpha has only been evaluated in fasted dogs; therefore, the effects on fed dogs (for example occurrence of vomiting) have not been characterized.

The concurrent use of anticholinergic medications and Zenalpha has not been evaluated.

Zenalpha may decrease serum glucose in healthy dogs and this effect may persist longer than sedation.

The safe use of Zenalpha has not been evaluated in dogs with hepatic or renal impairment, dogs younger than 4.5 months old, or dogs that are pregnant, lactating, or intended for breeding.

ADVERSE REACTIONS: The most common adverse reactions observed in the field study were decreased body temperature (not requiring external heat support), reduced respiratory rate, diarrhea, muscle tremor, signs of colitis, hypothermia (requiring external heat support).

To report suspected adverse events, for technical assistance or to obtain a copy of the SDS, contact Dechra Veterinary Products at (866) 933-2472. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/reportanimalae>.

MANUFACTURED FOR:

Dechra Veterinary Products
7015 College Boulevard, Suite 525
Overland Park, KS 66211 USA

Approved by FDA under NADA # 141-551

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