



# Addressing Rationale, Regulation, & Adverse Effects of FEEDING SUPPLEMENTS

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Read **Surveying Supplements: Current Trends, Research, & Recommendations** in the May/June 2014 issue of *Today's Veterinary Practice*.



## RATIONALE

Growth of the supplement market has followed increased interest in alternative, complementary, and natural treatments. While no definitive studies on the psychology of pet supplement use exist, clinical experience suggests that dietary additive use is based on several reasons.

### 1. Perceived Deficiencies in Commercial Pet Foods

Owners often justify the need for supplementation based on:

- Distrust regarding formulation of specific foods
- Belief that condition-specific increases in nutrients are warranted
- Desire to add nutrients not commonly found in pet foods.

### 2. Preference for “Natural” Treatments

- Nutraceuticals and supplements are often accepted as having biologic effects but are regarded as having fewer side effects or toxicities.
- Most supplements are heavily marketed as being naturally derived and safe.

### 3. Drug Synergy or Side Effect Mitigation

- Nutraceuticals may be used to prevent known side effects of drugs, such as hepatic enzyme elevations.
- The integration of “natural” and pharmaceutical drugs is often regarded by owners as a more efficacious treatment than conventional drugs alone.

### 4. Perceived Reduction in Disease Morbidity or Mortality

- Owners of oncologic patients appear specifically inclined to use dietary supplements, with or without conventional care, to try to increase survival times. Studies found that about one half of patients in a veterinary oncology referral service received dietary supplements, with vitamins administered to 35% and herbs to over 15%.<sup>1</sup>
- Chondroprotectants are an example of supplements used to decrease disease morbidity—for prevention and treatment.

## REGULATION

Concerns regarding dietary supplements include the lack of:

- Scientific literature on efficacy of many products
- Regulation.

Human dietary supplements are regulated by the Dietary Supplement Health and Education Act (DSHEA), which does not require registration or premarket approval of supplements, but does require good manufacturing processes, reporting of adverse events, and truthful labeling and advertising.

Meanwhile, the Food and Drug Administration (FDA) does not enforce DSHEA standards on products intended for animal consumption.<sup>2</sup> Therefore, legal supplements for animals are regulated under 3 separate categories (**Table**).

TABLE. Categories of Legal Supplements for Animals

ORGANIZATION	GUIDELINES
<b>1. Food, Food Additive, or Generally Recognized as Safe (GRAS) Ingredient</b>	
<b>FDA Center for Veterinary Medicine Association of American Feed Control Officials (AAFCO)</b>	<ul style="list-style-type: none"> <li>Ingredients cannot be used to treat, prevent, or mitigate disease<sup>2</sup></li> <li>Product labeling <i>cannot</i> make therapeutic claim</li> <li>FDA permits some unapproved food additives in the absence of adverse effect data, if the labeled use is widely accepted</li> <li>Examples include multivitamins, glucosamine, and chondroitin</li> </ul>
<b>2. Animal Drug</b>	
<b>FDA Center for Veterinary Medicine</b>	<ul style="list-style-type: none"> <li>Recognized as nonfood items that alter structure or function, and includes many naturally-derived supplements</li> <li>Legally requires scientific data and a New Animal Drug Application<sup>2</sup></li> <li>Most animal supplements that make treatment or prevention claims are <i>unapproved and illegal</i> animal drugs, but have low regulatory priority</li> </ul>
<b>3. Dietary Supplements Intended for Human Consumption But Used Off-Label in Animals</b>	
<b>Dietary Supplement Health and Education Act (DSHEA)</b>	<ul style="list-style-type: none"> <li>DSHEA governs vitamins, minerals, amino acids, herbs, and extracts, which are now separate from food additives and drugs</li> </ul>

### ADVERSE EFFECTS

The safety profiles of most supplements are only anecdotally established. Adverse events from minerals and vitamins are well-described and occasionally seen with high doses, while adverse events from herbal medications and extracted compounds generally occur due to one of the following:

#### 1. Idiosyncratic or Unpredictable Interactions

- Any oral product may induce hepatotoxicity if individual toxicity is lower than in other members of the same species.
- Interactions have been reported between nutraceuticals, herbs, and drugs, but data is limited and generally not readily available.<sup>3</sup>

#### 2. Off-Label Use, Dose, or Combination

- Stimulants, such as ephedra (ma huang in Chinese), may induce toxicity if inappropriately used (eg, for

weight loss) or given in large amounts.<sup>4</sup>

- Licorice root, anecdotally administered for gastrointestinal complaints in small animals, produces pseudoaldosteronism at high doses.<sup>5,6</sup>
- Herb–herb interactions or product antagonisms are poorly described but also possible.<sup>7</sup>

#### 3. Inappropriate Processing or Misidentification

- Some herbal products may be toxic due to lack of appropriate processing (usually heat treatment) or inclusion of incorrect parts of plants.
- Some botanical products have been misidentified; for example, aristolochic acid induced nephropathy in humans results from the incorrect substitution of a similar sounding Chinese herb and causes significant renal pathology.<sup>8</sup>

#### 4. Contamination—Intentional or Inadvertent—and Purity

- Contamination with unlabeled substances has been documented in human performance dietary supplements.<sup>9</sup>
- In past studies, some herbal supplements have poorly conformed to ingredient concentration label values.<sup>10</sup>
- Adulteration with anti-inflammatory drugs has been reported in Chinese herbal medications from certain outlets.<sup>11</sup>
- Chinese herbal products for animals display batch-to-batch variability in mineral and heavy metal content.<sup>12</sup> ■

AAFCO = Association of American Feed Control Officials; DSHEA = Dietary Supplement Health and Education Act; FDA = Food and Drug Administration; GRAS = generally recognized as safe; NRC = National Research Council

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