

AAFCO Members, Pet Food Committee and other stakeholders,

Pet food makers working through the Pet Food Institute (PFI) have been engaged in the discussion of copper levels in dog food prior to the formation of AAFCO's copper expert panel. These discussions have focused consistently on nutritional science and the welfare of dogs.

Industry engagement, the JAVMA opinion article, the formation of an expert panel, the additional AAFCO copper working group and the FDA public meeting have brought a renewed level of attention to the issue of Copper Associated Hepatopathy (CAH). This engagement and awareness demonstrates continuous improvement, which we believe was the intent of the authors of the JAVMA opinion piece.

Products made by PFI members provide sole source nutrition to an overwhelming majority of the dogs living in U.S. households. As the industry that designs and creates these products, we believe that supporting a controlled copper claim is the wrong direction at this time due to the strong potential of harm to dogs and the misconceptions that consumers will draw from this claim.

More scientific research on this topic is needed and regulators, both AAFCO and the FDA, need to work with the veterinary community to take a regulatory approach under their own control rather than abdicating the responsibility to consumers and industry. AAFCO's first action was to form an expert panel to examine the potential of a problem. This was a sound approach. That panel determined that not enough science currently exists to make changes to the nutrient profiles and any change would be arbitrary. AAFCO and the Pet Food Committee need to listen to that recommendation and focus on a scientific solution instead of an easy regulatory stopgap.

We include a number of points and resources below – please note that most of our comments mirror those of the expert panel.

Could a controlled copper regulation do more harm than good?

- Contrary to the statement in the working group conclusion, this claim does not support animal health, but in fact could do the opposite.
- PFI counts numerous board-certified nutritionists and veterinarians among its members. There is a consensus opinion among them that if this well-intentioned regulation gets ahead of science, it could be potentially harmful to pets.
- Sufficient research data is not available that the proposed controlled copper claim will protect health; any protective benefit is merely a hypothesis.
- No study has demonstrated that feeding high levels of copper to dogs leads to copper associated liver disease in dogs without known genetic mutations and/or concurrent hepatic illness.

- The working group was in full agreement that the draft claim guidance utilizes an arbitrary maximum. This action conveys to researchers, veterinarians, and pet parents that purchasing this product will prevent disease and will ultimately stall the pursuit of needed scientific evidence to identify the true causes and factors that result in CAH.
- AAFCO is a science-based organization that claims to help keep food safe for pets and provides protection to consumers; will approval of this regulation, against the recommendations of the Expert Panel lead to additional regulations on other nutrients because of anecdotal evidence or consumer questions?
- As the proposed regulation PF10 (d)(1) is currently worded, “A claim of “low copper”, “low in copper”, or words of similar designation is not allowed.” This would stop the sale of therapeutic foods, defined as “Veterinary Diets” that are intended to be used under veterinary guidance. Therapeutic foods are specially formulated for the nutritional management of pets with specific conditions including those that require LOW copper. Stopping the sale of therapeutic diets would undoubtedly be harmful to those animals that truly need a veterinarian directed low copper diet.
- CAH is a disease with an unknown true incidence and a genetic involvement that is not fully elucidated. This claim is clearly intended as an implied drug claim with the acknowledgement from those involved that the purpose of the regulation is to address a presumed health benefit without the science to support the regulation. The intent for the claim is to prevent a perceived disease condition.
- There will be pet parents with animals at risk for CAH that will purchase this product and not seek veterinary care/oversight when it is most needed. These claims will lead pet owners to self-diagnose and self-treat their pets. Science-based regulations are established to ensure pet health. Setting regulations instead to appease pet owners regarding nutrient levels negates the knowledge and expertise of the NRC and the AAFCO expert nutrition subcommittee in making decisions in dietary copper recommended allowances.
- Self-diagnosis and self-treatment of sick pets will result in animal distress as has been documented in other veterinary diet experiences. Considering the establishment of a controlled nutrient claim, a recent survey documented that consumer perception believes it imparts a health need or benefit as demonstrated in Admundson et.al., 2024. Additionally, one organization has shown examples where a diet specifically formulated with below-AAFCO-minimum nutrient levels intended to support health in a specific disease was perceived incorrectly by pet owners who then fed a retail diet marketed with similar ‘controlled’ nutrient claims. Many pet owners by-passed their veterinarians and stopped feeding the veterinary diet as well as needed medications.
- Focusing on a single essential nutrient paves the path for imbalances among nutrient ratios that may have serious consequences for animal health.
- Would support for a controlled level claim negate how all other controlled claims are defined? We must be cautious in setting an unintended precedent. Regulators should consider the rigors in establishing nutrient tolerances when deciding to approve a claim conveying a nutrient limit.
- It is dangerous to put regulations forward that imply prevention of a disease (especially one with a known genetic component). If pets then develop copper storage disease while on a ‘controlled copper diet’ would this create liability for the pet food company and regulators that created the perception these are therapeutic and preventive?

It was a unanimous consensus of both the Expert Panel and the Working Group that more research is needed.

- The true prevalence of copper associated liver disease has not been determined, so the argument that there is an increased incidence should not be based subjectively on anecdotal experience.
- More data is necessary to determine if copper accumulation in the canine liver is problematic. A lot has changed in caring for dogs, feeding habits, and diagnostics regarding liver disease. This is leading to increased focus but not definitive answers.
- Inbreeding and genetic drivers may be a part of the explanation. The mutations in genes that are involved in copper excretion are just now being discovered. A genetic predisposition, hepatitis, and/or cholestasis, causing defects in handling copper excretion, makes dogs intolerant for high dietary levels of copper, and those dogs may benefit from copper-restricted diets.
- No reliable data to support the need for an arbitrary controlled copper level, which is inherently a drug claim, has been provided. Studies on copper content of liver biopsies referenced in the 2021 JAVMA viewpoint article and the Feb 8, 2024, FDA webinar have several limitations, including the lack of a healthy control group. The control group in one study was a group of patients that underwent liver biopsies, from which no necro-inflammatory lesions were found. Reasons for taking the biopsies were not mentioned nor was a dietary history available. The reasons for the 2 “eras” (1982-1988 and 2009-2015) are not well defined. In the [Strickland et al 2018](#) article cited as evidence of increasing copper levels, the authors point out that clinical relevance of the observed increases in hepatic copper concentrations remains elusive. Dietary histories of the study dogs were not available.
- An analysis of 16 years of hepatic data in dogs fed a wide range of commercial diets showed that liver copper concentrations decreased from 2006 through 2011, increased in 2012, decreased in 2013 and peaked in 2016 and have been decreasing ever since.
- Genetic informed breeding programs have effectively reduced the incidence of disease in the Bedlington Terrier. Is there a known non-genetic, diet associated liver disease co-hort? More research is needed to answer this.

It is inevitable that this claim will create consumer confusion.

- Rather than creating clarity for consumers, this claim will create confusion. Consumer data shows that pet parents will follow a claim even without understanding its impact to animal health and that this statement would be interpreted as an implied drug claim by a significant share of consumers.
- A consumer survey on this claim showed that a significant number of consumers will perceive less copper as better, regardless of the state of their pet. Responses showed that after hearing about a controlled copper diet some level of consumers wanted a dog food with zero copper. This was demonstrated on the FDA Grand Rounds- Copper in Dog Food: A Case Study in Reconciling Nutritional & Regulatory Science webinar when this exact question was asked in the chat.
- By AAFCO supporting this claim, it will create a market situation where some companies may be pressured into supplying these products in order to have a complete portfolio and meet

consumer demand, yet these products are confusing to consumers and potentially harmful to pets.

- Both AAFCO and the FDA were uncomfortable changing the nutrient profiles, this is not a solution to the problem.

Proposed Interim Solution

Given the high degree of controversy about the request, and the consensus that more research is needed, PFI members request a moratorium while supporting efforts to pursue collaborative research to produce data to study the incidence of disease and what controlled limits support normal hepatic copper in healthy dogs.

There have been several articles published since this discussion began, a few are listed here and should be reviewed by members of the Pet Food Committee.

AAFCO reaffirms guidelines on copper levels in dog food.

Scott Nolan, AVMA News, April 17, 2023

<https://www.avma.org/news/aafco-reaffirms-guideline-copper-levels-dog-food>

The Association of American Feed Control Officials (AAFCO) reaffirmed its guidelines for copper concentration in commercial dog foods after an expert panel concluded there is currently a lack of definitive evidence linking copper-associated hepatitis in dogs and the copper content in dog foods. “At this time AAFCO does not see the need to restrict the use of other sources of (copper) in dog foods beyond any restrictions already imposed in their definitions or approvals,” AAFCO CEO Austin Therrell wrote in March. “Until such time as science definitively shows additional controls or restrictions are needed, AAFCO feels that recommendations for (copper) concentration in foods for normal dogs are appropriately and sufficiently regulated at present.”

“Arbitrarily setting some value as a maximum for copper implies that diets containing less than, or equal to, the maximum are safe for dogs and that diets containing more than the maximum amount are unsafe, with neither condition having been demonstrated to be true,” the panel wrote.”

The art of establishing mineral tolerances of dogs

Abstract of article submitted to JAS

George C. Fahey, Jr., Marcie Campion, George Collings, Renan Donadelli, Leah Lambrakis, Matthew Panasevich, J. C. Peters, James Templeman, Leslie Hancock.

Dogs and cats are living longer and healthier lives through the scientific development of nutritional information. This information has allowed the building of many new types of foods, treats and supplements that promote life, health, and enjoyment by your pet. There are several organizations that have provided helpful reviews of nutritional data through scientific councils that help build safe and

healthy criteria for all food products. These are available for those who want to know more about pet nutrition.

For many nutrients, there is a large database of information to help build products. Nutrients that are called macro or micro minerals (e.g., sodium, potassium, zinc, copper, etc.) often have more limited information.

More recently strong opinions about pet health have been shared and robustly communicated without adequate scientific research to support the hypotheses. This has led to misinformation, many concerns and fear.

To safeguard the health of companion animals and provide assistance to the regulatory framework regarding nutritional welfare of dogs and cats, scientific panels have come together frequently from industry, government, and academia to review, approve, and challenge nutritional guidelines. This overview provides the reader context into the rigor needed to establish safe mineral tolerances for dogs.

16 years of canine hepatic copper concentrations within normal reference ranges in dogs fed a broad range of commercial diets

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10787350/pdf/txad147.pdf>

An in press JAVMA abstract: We are alerting the JAVMA editor that we are sharing this excerpt from the abstract.

Amundson et al have a study publication in final prepublication (JAVMA), that examined the effects of age, sex, breed, liver histopathology, and year of death/sample collection on liver copper concentrations in dogs fed various commercial dog foods throughout their lives. Analysis of year of death showed that liver copper concentrations decreased from 2006 through 2011, increased in 2012, decreased in 2013 and peaked in 2016, decreasing thereafter. Mean copper concentration of abnormal liver histopathology samples was lower than mean copper concentrations of normal liver histopathology samples. Age (12.95 ± 2.67) and sex had no effect on liver copper concentrations. Liver copper concentrations varied significantly with breed and year of death; however, average liver copper concentrations of each year are within normal reference ranges. This was a retrospective study of dogs fed a wide variety of commercial foods and serves as a controlled baseline of hepatic copper levels. Prospective and controlled studies are needed to further understand what factors influence canine hepatic copper concentrations.

Dog and cat owners have minimal awareness of copper's function in pet food and certain claims create negative bias

Madison D. Amundson, BS; Laura A. Motsinger, PhD; Leslie Hancock, DVM

An in press JAVMA article The Association of American Feed Control Officials (AAFCO) recommends a copper minimum, but not a maximum concentration in pet foods which, in turn, has raised concerns about the potential for copper toxicity in dogs and cats. AAFCO convened a panel of nutrition experts who were investigating the matter and found insufficient evidence to suggest a maximum. However, an option was proposed to consider establishing a standard for low or controlled copper diets. This survey investigated pet owner awareness of dietary copper in pet food. A blinded panel invited 2877 pet owners to participate in the survey and was completed by 252 dog and cat owners. Results reported 78% having very little (n=47) or no (n=149) knowledge about the role of dietary copper in pet food and,

about half of respondents reported being “uncertain” about a “low, moderate, or controlled copper” statement. Consequently, 19% of owners claimed that their purchasing decisions would be strongly influenced by a similar statement, but 47% said they may be impacted; totaling 66% seeding a negative bias. Of all participants, 56 owners reported that they would buy a controlled copper food for various reasons including, but not limited to, safety and health purposes, quality concerns, nutritional awareness, and general beliefs. Conversely, 34 owners reported that they would not buy a controlled copper food due to unfamiliarity and desire for more knowledge around the role of dietary copper. Overall, 28% of owners feel there are benefits to a controlled copper food, while 57% are unsure if there is an advantage or disadvantage but would consider it. These insights suggest that certain claims prompt dog and cat owners to desire additional education around the role of dietary copper, and potentially other nutrients, in pet food and raise concerns with the role of claims and negative nutrition bias.

Copper metabolism and its implications for canine nutrition

Laura A Amundson, Brent N Kirn, Erik J Swensson, Allison A Millican, George C Fahey
Transl Anim Sci, . 2024 Jan 3:8:txad147. doi: 10.1093/tas/txad147. eCollection
2024. <https://pubmed.ncbi.nlm.nih.gov/38221962/n>

Canine copper nutrition has received increased attention due to recent reports of apparent copper-associated hepatitis in the USA and European Union. In order to properly address the need to modify the U.S. National Research Council and Association of American Feed Control Officials canine copper recommendations that will have implications for all dogs, it is important to understand the complexities of copper metabolism, confounding variables affecting copper status, and the available research on this topic in dogs. Recent trends in consumer preference for dog diets, supplements, and functional treats introduce another layer of complexity, as most ingredients used in these formulations provide vastly different proportions of essential nutrients, thus resulting in great variation in nutrient profiles available to the animal. Given its vital role in many physiological processes, it is important that both nutritional deficiencies and toxicities be avoided. There are important nutrient interactions that need to be accounted for. Zinc, iron, molybdate, and sulfur are all known to antagonize the amount of bioavailable copper. Zinc is a potent inducer of MT production that will preferentially bind and sequester Cu⁺ and, thus, increase the risk of a zinc-induced copper deficiency, regardless of dietary copper concentration. High dietary iron can cause copper-deficient anemia via disturbances in copper utilization after it has been absorbed ([Ha et al., 2017](#)). Concomitant increase in iron and copper concentrations was observed and compared among dogs with varying degrees of liver lesions ([Schultheiss et al., 2002](#)) and underlines the possibility of other mineral contributions to hepatic pathologies. Although there are few data about the interaction of copper and lead, [Gori et al.](#) (2021) observed increased liver lead concentrations in dogs with liver copper concentrations above 400 ppm (dry weight basis). Similar to the iron and copper relationship mentioned earlier, there is not sufficient evidence to determine causation versus correlation, but these results emphasize the need for further investigation of the overall nutrient status of dogs suffering from CAH. Therefore, it is imperative that veterinarians, nutritionists, and pet food manufacturers collaborate with the shared goal of providing dog food options that supply the essential nutrients at adequate concentrations to support an active and healthy life.

Is copper-associated hepatopathy the new DCM?

Stephanie Clark, S. McCauley and B Quest. Pet Food Processing, January 2024

<https://www.petfoodprocessing.net/articles/17850-is-copper-associated-hepatopathy-the-new-dcm>

Authors are all board certified nutritionists.

The push to scrutinize copper mirrors the methodology that sparked the controversy around DCM, namely a reliance on anecdotal observations and retrospective case studies with significant limitations that should not be used to draw sweeping conclusions. Regardless of comments from the opinion article in JAVMA, the actual incidence rate of copper-associated hepatopathy is still unknown. When pet owners are faced with situations where the science is unclear but scary headlines are abundant, they don't know who to trust and don't have enough information to make an informed decision. In 2016 there were concerns in the veterinary community that copper was insufficient in pet foods. There needs to be sound scientific research with control groups and sufficient animals.

COMMD1 Exemplifies the Power of Inbred Dogs to Dissect Genetic Causes of Rare Copper-Related Disorders

Ronald Jan Corbee and Louis C. Penning

Animals **2021**, 11(3), 601; <https://doi.org/10.3390/ani11030601>

Copper storage disorders are considered rare diseases. Although the European Union (EU) and the United States have different definitions of rare diseases (EU, not more than 50 per 100,000; US less than 200,000 patients in the US, recalculated as around 86 per 100,000), it is clear that for each individual rare disease, no large patient cohort exists.

Sincerely,

A handwritten signature in cursive script that reads "Dana Brooks".

Dana Brooks

President and CEO Pet Food Institute