



## Chemicals in Dry Food for Household Pets

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**ABSTRACT:** Due to the fact that kidney failure is a certainly common disease among pets and the cause of it mostly comes from ingestion, the primary objective of this research is to investigate chemicals in dry foods for pets and its effect. Proper nutrition is required for pets because it can improve the quality as well as the longevity of a pet's life. Even though dry food usually contains a higher level of protein which helps animals continue to develop their authentic, carnivorous characteristics, there are drawbacks to it such as increasing the risk of constipation along with the extra additives added. Thus, an animal's diet must be observed and measured carefully for their well-being.

**KEYWORDS:** Animal welfare, Animal's diet, Chemicals, Dry food, Food for pets, Kidney failure.

### 1. INTRODUCTION

#### 1.1 Introduction to Dry Food for Pets

Dogs are a member of the biological order Carnivora, which includes a sizable group of mammals with comparable tooth structures. The food requirements of the many animals in this order differ, since there are two smaller groups to classify carnivores, obligated and genuine carnivores. Those are the members who must consume meat in their diets at all times, while herbivores and mixed carnivores can eat enough plant matter to suit their nutritional needs (omnivores). An example of an obligate carnivore is a cat, a cow is an example of an herbivore, and two examples of omnivores are dogs and people.[1] According to an American Pet Products Association (APPA) poll from 2021–2022, 70% of homes had pets.[2] With this increasing rate, the food technologies for pets are skyrocketing. It allows pets to have a wide selection of foods while eating, whether it is dry food, wet food, or a combination of both.[3] A survey research was conducted among pet owners and the majority of them (75.7%, 1682/2221) feed their pets with dry food.[4] Dry food, often referred to as kibble, it is usually made up of grains, vegetables, and meat that has been dried and molded into tiny pellet-sized bits. Thus, a lot of pet owners believe that it will give their pets all the nutrients they need for a healthy lifestyle.[5] These meats are usually made from rendered meat by-products (livestock, seafood, horses and other dead animals). Moreover, they contain corn gluten feed, powdered fruit and vegetables which are mostly imported from China, preservatives, stabilizers, gelling agents, synthetic vitamins and minerals, and palatability enhancers like yeast, fat, sweeteners or concentrated flavors. They also usually contain grains, which are very difficult for dogs to digest, making them convert those grains to sugar, resulting in an overweight pet.[6] Pet foods must contain more than 30 key nutrients they require, it is the most crucial factor to take into account. These nutrients include: protein, amino acids, fatty acids, vitamins, and minerals.[7]

#### 1.2 Types of Food for Pets

- Dry Food

Many pet owners pick dry food for their pets because it is the most affordable sort of commercial food. Additionally, it does not require refrigeration and lasts for a very long period. It can also benefit the animal's teeth as well as prevent tartar formation.[8]

- Canned

It is often known as wet food; the prices are quite high but they are long lasting. Although some owners find it cost-worthy, not all commercial canned food brands contain the necessary amount of protein for pets. The amount of digestible protein it offers is the major concern. Inedible protein is essentially useless to dogs/cats because it will pass through the system unprocessed and unconverted into nutrients.[8]

- Semi-moist

Semi-moist foods are marketed dog treats that resemble hamburgers, pork chops, or other meaty foods. These diets feature a lot of artificial tastes and colors, they are extremely low in nutrients, which, therefore should not be considered as a main diet for pets.[8]



- Home-made

A home-cooked diet enables the owner to be fully assured that their pet's nutritional needs are being satisfied and to know exactly the ingredients in the food. However, a home-cooked diet takes time and money, but many owners believe the extra work is worthwhile for the added peace of mind. Owners who do this must educate themselves on the required nutrition of the type of pet that they own to ensure that their pet is receiving all the essential nutrients.[8]

- Raw

Currently, raw diets have become increasingly popular among dog owners, even though the benefits of it still remain unanswered.[9] The diet contains bones which are a natural supply of calcium and phosphorus, and organs. Since dogs have short intestinal tracts and powerful stomach acids, which both make it simple for them to eat and digest raw food, this type of diet works well for many dogs. Despite this, it is crucial for pet owners to discuss this change with their pet's veterinarian.[8]

### 1.3 Role and Importance of Food for Pets

Animals cannot produce nutrients on their own; therefore, a balanced meal with a high nutritional content will satisfy their dietary needs. The pet's health will be maintained and given vitality by nutrients. A healthy diet, however, does not mean only mean the food that pets ingest, but the activities that they do, too.[10] A robust immune system and better overall health for all of your pet's body processes are supported by high-quality nutrition. The exact opposite is also true, though, when it comes to inadequate nourishment and poor nourishment. Foods of lower quality are more likely to have substances and additives that could be detrimental to pets.[11] A good diet must contain:

- Water: A pet's body cannot function correctly if it does not have constant access to fresh, clean water. Moreover, long-term dehydration can actually result in problems like loss of consciousness and organ damage.[11]

- Protein: For optimal pet diet, protein is essential because it produces hormones and enzymes. They also build and repair muscles and bones, which give pets the energy they require to live a long and healthy life. While eating a lot of plants can be good for a dog's health, meat is still necessary for a balanced diet.

Cats, which are carnivores, must eat food which contain a higher amount of protein.[11]

- Fats: The energy needed for normal biological activities is abundant in fats. Both animal and plantbased foods include healthful fats. However, an excessive amount of fat in a pet's diet can cause obesity and heart problems. With the right ratio of fats in their diet, pets will remain healthy and active.[11]

- Vitamins and Minerals: The proper ratio of vitamins and minerals is necessary for a number of biochemical activities in the bodies of pets. This is due to the fact that, they support the immune systems of these household animals. They also guarantee that our pets' food contains the nutrients they need to function properly. This is so because vitamins and minerals have an impact on how easily proteins and carbohydrates may be digested.[11]

- Carbohydrates are an essential component of a healthy diet. They make up roughly 55% of the normal dry pet food since they are full and act as a quick source of energy. Carbohydrates are best taken by pet in moderation, like with everything else. In the body, carbohydrates are transformed into sugar, so an excess amount of it may cause obesity if the pets are not sufficiently active.[11]

## 2. CHEMICALS IN DRY FOOD

Nowadays, pet parents have become more aware of what they are feeding their household pets. Moreover, a complete and balanced diet includes proteins, fats, carbohydrates, vitamins, and minerals while water is also essential to life and is needed daily. This may seem very simple and easy with the basic ingredients broken down, but understanding how each nutrient is used in a household pet's body, understanding the processes, and knowing how much of each nutrient is needed for a healthy household pet at all life stages is very complex.[12] Nevertheless, one of the most lethal chemicals in the world is a toxin produced by bacteria. Botulinum toxin which is the same chemical used in Botox, injected into the bodies of women and men around the world for the primary purpose of having smoother, younger looking skin.

Again, it's all about the dose.[13]

**Propylene glycol**, a substance found in many dog treats and even some dog foods, was recently in the news because it was said to be antifreeze, a highly toxic substance to pets. Unfortunately, the difference between ethylene glycol (used in antifreeze) and



propylene glycol was not discussed until after the news went viral. However, propylene glycol is a safe ingredient when found in dog foods at an appropriate inclusion level. An interesting point to make is that propylene glycol is not allowed in cat foods or cat treats because it is toxic to cats, another example of why we cannot transfer health information from humans to pets or even from dogs to cats. Therefore, many pet foods make claims that their food is natural with added vitamins and minerals. The use of natural on the packaging is highly regulated, and reviewed as part of the registration process required to sell pet foods in individual states. Many vitamins and minerals are synthetically created, which is why they fall outside of the definition of natural. This does not mean that these ingredients are toxic, although they could be if added in excess (refer back to the quote from Paracelsus). Equally dangerous is a deficiency of any essential vitamin or mineral. To manufacture a diet that is complete and balanced, serving as the sole source of nutrition on a daily basis for a pet, requires the addition of these essential nutrients.[14]

**Copper** is an essential mineral nutrient that also recently made headlines and must be included in dog foods complete and balanced for all life stages at a minimum of 7.3 mg/kg on a dry matter basis. The maximum amount allowed is 250 mg/kg on a dry matter basis. For cat foods, the minimum amount is 15 mg/kg on a dry matter basis and there is not a maximum stated. Pet foods are required to be manufactured to meet these nutritional levels unless the food has undergone an Association of American Feed Control Officials (AAFCO) feeding trial, proving that it is complete and balanced and safe to feed with a level of copper that falls outside the recommended range. Nonetheless, copper storage disease is a real problem in some dogs, but not in most. Feeding dogs affected by copper storage disease a diet that is complete and balanced for normal healthy dogs certainly may not be appropriate, but it is also not appropriate to consider that dog foods should be made without adequate levels of this essential nutrient on the off chance that a dog with undiagnosed copper storage disease may consume them. Creating deficiencies in a large group of dogs to protect the health of a few is not a reasonable approach.[15]

Natural preservatives used in pet foods can be very confusing when the CFR (Code of Federal Regulations) and the AAFCO Official Publication (OP) are reviewed. Tocopherols, naturally occurring vitamin E compounds, are widely used as natural preservatives in pet foods and various pet food ingredients. However, they are listed as a chemical preservative in the OP. Stepping back to the world of science, we have to consider the difference between organic chemicals and synthetic chemicals. Organic chemicals occur in nature and are natural, despite the word chemical. This is exactly the case with tocopherols.[16]

While the pet food industry might consider these concerns to be without merit, consumers do not. Catering to every whim of the consumer is certainly not possible, but bringing science back into the conversation when discussing common pet food ingredients is critical to success. As consumers drive trends that lead to the use of more unusual and unique ingredients, more questions will arise that need to be answered.[13]

### 3. EFFECTS OF CHEMICALS IN DRY FOOD ON PETS AND ANIMALS

Preservatives are the most common chemicals found in pet foods today. These are synthetic and are used to keep food from spoiling. Tert-butyl hydroquinone (TBHQ), butylated hydroxyanisole (BHA), and butylated hydroxytoluene (BHT) are examples. Ethoxyquin is also another common preservative chemical. These are replacing natural preservatives because they are less expensive and have a longer shelf life. The problem, however, is the issue of toxicity. Ethoxyquin is a preservative that is also used as a hardening agent in the manufacture of synthetic rubber and as a pesticide. It has been linked to blood and liver problems in dogs. Both BHT and BHA are suspected of containing compounds that cause cancer in pets, but they are still used in commercial dog food. Propylene Glycol (PG), in addition, is derived from a chemical that is also used in antifreeze and is extremely toxic to dogs. Regardless of what the advertisements say, PG can endanger pets if it is used as a moistening agent in dog food.[17]

### 4. CONCLUSION

It's best to offer pets animal food that is appropriate for their species, age, and degree of activity whenever possible. Since there is a variety of animal food to choose from, there are a lot of factors to be considering. Each type of food has its own benefits and disadvantages. However, the food that pets ingest must not contain toxicity such as Propylene Glycol, butylated hydroxytoluene (BHT), butylated hydroxyanisole (BHA) and other preservatives mentioned, because in the long run, this can affect pets by giving them chronic diseases. Water is also a major component of food to consider, this is due to the fact that water regulates the animal



body. Other nutrients (protein, carbohydrates, lipids, vitamin, and minerals) are all crucial to an animal's life. Owners should know that by keeping them as a pet, they should try their best to provide what their pets need at most.

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