

## This Enhances Salmonella Control in Your Dog's Food

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Analysis by Dr. Karen Shaw Becker

### STORY AT-A-GLANCE

- A recent study shows that the addition of lactic acid to high pressure processing of raw dog food results in significantly enhanced pathogen control
- In raw dog foods treated with lactic acid, there was a 475-fold reduction in the probability of salmonella contamination
- Additional FDA-approved processes raw pet food producers use to ensure bacteria-free products include UV light, ozone, bacteriophages, batch testing, and fermentation

Lactic acid has been used for ages as a preservative in human foods, including sauerkraut, sourdough, and other **fermentables**. It has also been used in ultra-processed pet food for over 60 years to discourage mold and other microbes in moist products, and to enhance palatability and moisture retention.<sup>1</sup>

When it comes to raw diets for pets, manufacturers remain under close scrutiny by the U.S. Food and Drug Administration (FDA) with regard to pathogen control. Raw pet foods must meet stringent federal regulations against pathogens, while still maintaining the rawness of the products. Toward that end, many raw diet producers use high pressure processing (HPP) to eliminate salmonella and other microbes in their products.

Senior reporter Tim Wall, writing for PetfoodIndustry.com, describes the difference between conventional and high-pressure food processing:

*"Conventional production and sterilization methods tend to heat the foods to the point of cooking. High pressure processing provides an acceptable option for raw pet food by creating intense force uniformly around a pet food container, usually in a sealed tank of water. That pressure is transferred instantly and equally throughout the raw pet food.*

*"Under this high pressure, disease-causing microorganisms and food-spoiling enzymes are deactivated. The technique works regardless of package size and shape, as long as the container can withstand the processing conditions. The pressures used in HPP cause few physical changes to the ingredients since the pressure doesn't seem to seriously affect covalent bonds (a type of atomic-scale attraction) in foods."<sup>2</sup>*

One drawback to HPP is the amount of time required to process raw ingredients, which affects energy usage, cost, and the physical properties of the final product.

## Lactic Acid Significantly Enhances HPP Pathogen Control

Recently, researchers in Spain investigated the use of lactic acid to increase the effectiveness of HPP as a means of pathogen control. They published their findings in the journal *Animal Feed Science and Technology*.<sup>3</sup>

The study co-authors applied lactic acid in concentrations ranging from 0 to 7.2 g/kg to raw dog foods during high-pressure processing and evaluated its influence on the ability of **salmonella** to survive HPP. They also evaluated the effects of pressure intensity and pressure-holding time from 0 to 7 minutes.

*"After four minutes of high-pressure processing treatments at 500 megaPascals," writes Wall, "the scientists estimated the probability of salmonella contamination of a non-acidulated product to be .03%. An extra four to six minutes under pressure reduced that probability by approximately 50 times."*

The addition of lactic acid produced an even more dramatic effect:

*"In raw dog foods with 3.6 g/kg of lactic acid, the increase in processing time resulted in a 475-fold reduction in the probability of salmonella contamination."*

The scientists concluded that adding lactic acid to raw pet foods may prove highly beneficial in reducing the potential for contamination.

Lactic acid is also used in another method to control bacterial growth in raw pet food: fermentation.

## Methods for Producing Bacteria-Free Raw Pet Food

- **Fermentation** — Fermentation is a method of inoculating raw ingredients, which enables beneficial bacteria, including lactic acid bacteria, to produce an antimicrobial substance called bacteriocin that protects the food against pathogenic bacteria blooms through manufacturing, distribution, and storage, all the way to your pet's bowl.
- **High-Pressure Processing/Pasteurization (HPP)** — HPP is an FDA-approved process that is used extensively in the human food industry. Unfortunately, HPP also eliminates beneficial probiotic bacteria, which is why its critics don't like it. The process works by applying a very high hydrostatic pressure up to 80,000 pounds per cubic inch to eliminate all potentially pathogenic microbes.

Critics of HPP believe it's a fairly extreme method of processing whole foods because, depending on the amount of pressure used, research has demonstrated that proteins in the food can denature, and beneficial bacteria are obliterated. There is also some concern about the risk of pets ingesting plastic residues called phthalates as a result of high-pressure processing. Of course, you could be ingesting them as well if you're eating human foods that have been HPP'd.

Critics of HPP also believe it's a method of processing whole living food into a modification of whole living food, and that we shouldn't confuse truly unadulterated raw food with raw food that has been high pressure processed. Feeding solely pasteurized food to dogs and cats isn't natural, nor beneficial for supporting or maintaining a healthy microbial balance long term, in my opinion, but it's fantastic when needed for specific medical conditions or when owners are immunosuppressed.

HPP has been found to be most effective in managing bacteria in pre-cooked foods. Ironically, uncooked foods (raw) that have undergone HPP may have more potential bacterial proliferation once the container is opened than non-HPP'd foods. So, it's possible HPP may actually increase the risk for growth of pathogenic bacteria once the package is opened or in the event of manufacturing or packaging defects.

With all that said, there is certainly room for virtually sterile food in the marketplace. In theory, HPP'd food is the safest food on the market because it's devoid of all bacteria. In my experience, this is something the vast majority of veterinarians don't realize.

So, if you come across veterinarians who say things like, "All raw food contains bacteria that could be harmful to your animal," inform them that up to 40% of commercially available raw food diets on the market are devoid of all bacteria (even the beneficial bacteria that build the microbiome) because they've undergone this particular processing technique. HPP'd raw foods are bacteria-free and that's something no kibble in the world can claim.

If you have young kids in the house or an immunosuppressed individual, pressure-pasteurized raw food may be a great option for you. This is also my recommendation as a food choice for pets who have had recent gastrointestinal (GI) surgery and need a very clean food choice during recovery.

- **Ultraviolet (UV) light** — Many raw pet food manufacturers use HPP, but others use ultraviolet (UV) light technology that creates antimicrobial conditions in addition to the germicidal properties of UV. This makes it possible for portions of the manufacturing process such as grinding, patty-making, and packaging to be accomplished without risk of environmental contamination, because pathogens are systemically destroyed in the environment when this technology is operating.

There are three varieties of UV light, distinguished by wavelength (UV-A, UV-B, and UV-C). UV-C has the shortest wavelength and is the type used for food production. According to the FDA, UV-C at 200 to 280 nanometers is within the germicidal range proven to reduce or eliminate E. coli, salmonella, listeria, and other foodborne pathogens.

- **Ozone** — Ozone is another method that some raw pet food producers use to manage potential bacteria. Ozone is a form of oxygen recognized as a broad-spectrum biocide against viruses, bacteria, biofilms, fungi, and protozoa. None of these pathogens can build up a tolerance to ozone because it disinfects by oxidation processes. Instead of poisoning microorganisms, it actually destroys them through oxidation.

Ozone gas is pumped into cold water, and then the ozonated water is used as a rinse, mist, spray, or bath for the meat. The ozone survives for only a matter of minutes before decomposing into ordinary oxygen, making it entirely non-toxic.

- **Bacteriophages (Phages)** — **Bacteriophages**, aka "bacteria eaters," are benign viruses that target specific bacteria, infecting and killing them. Phages are ubiquitous — they're found everywhere on earth. They're inside our bodies and our pets' bodies, on our skin, in the soil, and even in the ocean.

Phages are very specific in that they can only infect their targeted bacteria. They have no effect on any human, animal, plant, insect, or other cells. Unlike other methods used to kill pathogens, bacteriophages don't affect the color, taste, texture, or odor of ingredients. It's 100% natural approach to killing bacteria in raw food.

Phage technology is also less expensive and easier to use than other methods. It's applied as a fine mist to

ingredients, so raw pet food producers — many of whom are small operators — don't need to purchase highly specialized equipment.

- **Batch testing** — Batch testing is another way that raw pet food manufacturers manage potentially pathogenic bacteria. Samples of finished products are tested for harmful bacteria, and if none is found, the batch is shipped to market. Pretty easy. This is the oldest and most tried-and-true method approved by the FDA to evaluate meat for human consumption.

A potential problem with this method is that pathogens aren't evenly distributed throughout food, so sampling may or may not pick up the presence of pathogens.

As you can see, raw food manufacturers use a variety of FDA-approved methods to manage potential pathogenic bacteria in their products.

If you're curious about the raw pet food you purchase, you can research the company's website or call the customer service line to find out exactly what method is being used to comply with the FDA's Food Safety and Modernization Act.

That being said, it's important to keep in mind that the raw meat used in many commercially available raw pet food diets is human-grade, USDA-inspected, and virtually no different from the steak and chicken purchased for human consumption from your local grocery store. Again, ask the manufacturer if they use human-grade meats in their products.

Obviously, raw meat for your pet should be handled with the same safety precautions you use when you prepare meals for your family. It's all the same meat, so if you're cutting meat on your kitchen counter, whether it's destined for your pet's bowl or your dinner plate, you should disinfect your bowls, counters, cutting board surfaces, and utensils.

## How to Keep Your Pet Safe From a Salmonella Infection

If you feed raw, I recommend freezing meat or meat mixtures in individual serving-size packets for 3 weeks (this duration of time kills a variety of meat-borne parasites). Defrost in refrigerator overnight. Use safe food handling techniques. Clean and sterilize all utensils, bowls, surfaces, and equipment after each use.

Discard any uneaten raw food after 30 minutes. A strong, resilient digestive system is necessary to handle a bacterial load and to support immune system function. Three steps you can take to keep your pet's GI tract in good shape include:

- Minimize physiological stress by feeding a nutritionally diversified, species-specific diet (and don't use guesswork to determine if your pet's meals are nutritionally complete)
- Minimize the unnecessary drugs your pet takes, including antacids that neutralize stomach acid, routine dewormers (especially if your pet doesn't have parasites)
- Reseed the gut during and after **antibiotic therapy** with a probiotic and feed probiotic-rich foods
- A good-quality digestive enzyme for pets will help promote your dog's or cat's body to get the most out of the food you feed

## Sources and References

<sup>1,2</sup> [PetfoodIndustry.com](#), August 15, 2022

<sup>3</sup> [Serra-Castello, C. et al. Animal Feed Science and Technology, Volume 290, August 2022, 115347](#)

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