

nonHPP vs HPP laboratory analysis

Written by Chelsea Kent

TESTED NUTRIENTS AND CONTAMINANTS:

The science around HPP shows that the nutrients that have been proven to suffer the most damage are those that are commonly not tested:

- Glutamine amino acid (and MSG by-product from fractionation) and amino acids (including Taurine)
- Vitamin A
- Vitamin C
- Lycopene
- Oxidation
- Phthalates and BPA (plastic contaminants)
- Pathogens at 24-hours of temperature abuse
- B-vitamins – B-Vitamins are fragile and likely to be damaged by excessive processing. This is why they are added in synthetic supplement blends in most heat-processed pet and human foods. A laboratory can choose the sensitivity of its equipment. They could choose to have machinery that can only detect down to the gram, the milligram, microgram, or even the tenth, hundredth, or thousandth of a microgram. With B-Vitamin and Heavy Metal testing, laboratories will often have sensitivity detection levels that are higher than necessary to provide accurate data. This can mislead consumers into believing that a nutrient level is acceptable.

For example, the body only needs micrograms (ppb) of Vitamin B12 every day. If a laboratory provides a report with a Limit of Detection (LOD) of 0.63mcg/g, one would not be able to determine if the nutritional adequacy of product because the LOD too high. The laboratory report could list the nutrient level as, "<0.63mcg/g" when it contains only 0.005mcg/g. A consumer would be misled to believe that it has adequate Vitamin B12 when, in fact, it could contain absolutely no Vitamin B12 at all. It is imperative the Limit of Detection (LOD) is stated on the lab report and it is sensitive enough to provide accurate data.

DAMAGED CELLULAR INTEGRITY:

Scientific data evidences that HPP has been shown to fragment the cellular structure, making it "leaky" (like a blown-up building vs a complete, finished building). Data determining the effects of consuming, as a complete diet, destroyed cells is incomplete. Nature does not provide large quantities of ruptured cells except in, perhaps, very rotten corpses. In rotting tissue, science shows that histamine and inflammatory compound levels are increased, sometimes dramatically.

It's implied that nutrient levels are increased in HPP products as if nutrients can be magically added by damaging the cells. If the proverbial building mentioned above was full of people and you (the lab machinery) could only see some of the people (nutrients) inside the cell (the building), then it was blown up and all the people became visible because they're floating around outside of the building that no longer has walls... does that increase the NUMBER of people or just the visibility? People certainly didn't reproduce because the building blew-up, and neither did the nutrients. In addition, the digestive system is designed to utilize nutrients from inside of cells. The body's ability to properly utilize nutrients that are not in their natural form is minimally understood.

WATER LOSS:

As stated above, cellular integrity is damaged in the processing of HPP products. This is seen in the example below, with a slight decrease in protein as a significant decrease in product moisture. The example product contained 69.26% moisture before HPP and 60.30% moisture after. This is a 13% loss of moisture in the product. The only way to fairly compare these is by comparing Dry Matter (DM) since the moisture content is not the same in each sample, so below is the DM comparison.

Sufficient water intake keeps the body healthy. This is one of the most beneficial components in raw pet foods. In addition to its contributions to whole-body health, water contributes to the body's ability to transfer nutrients from place to place. This is imperative for health. The reduction in water could potentially result in an equal reduction in a positive response to nutrients.

It is impossible to compare the nutrient content of two reports with different moisture levels unless you convert the nutrients to Dry Matter (DM). In the samples referenced below imply that some nutrient levels increased after HPP. For example, magnesium levels went from 3.1mg/100g to 3.51mg/100g and phosphorus levels went from 235.8mg/100g to 348.3mg/100g. However, when converted to dry matter, magnesium levels are 0.02% of the product in both nonHPP and HPP samples, and phosphorus levels are 0.232% in the nonHPP sample and 0.248% in the HPP sample (an increase of 0.016% - nearly undetectable.)

PLASTIC (PHTHALATE) CONTAMINATION:

Most companies do not test phthalate or BPA levels in HPP products. HPP hits its plastic outer casing with 87,000psi of pressure. This amount of pressure exceeds that of 6.3x the deepest depth of the ocean. How much microparticle plastic is getting pushed into the product in that process? And WHICH phthalates are in the plastic they are using? The Know Your Pet Food Initiative lab tested phthalate levels in popular pet foods and found phthalates that are banned for use in children's toys due to their toxicity. This proves that these phthalates would be expected in heat-processed foods and could get into HPP foods as well. Without identifying phthalate levels in the final product, it would behoove one to assume its unsafe for regular use. Using a high-phthalate product as a sole source of nutrition is likely to result, eventually, in endocrine imbalance. While hormone imbalances, all on their own, are a big pain with a lot of frustrating symptoms, they also force imbalances in tissue minerals and increase the risk of heavy metal toxicity. Ultimately, over time, the problem can become a tsunami of problems.

FORMATTING OF LABORATORY REPORTS:

Most labs provide reports with inconsistent units of measure, making them impossible to read for most consumers. The sample data below was provided in the following units of measure: mg/100g, mcg/g, ppm, and %. Without the ability to convert these to levels that will match the AAFCO or FEDIAF nutrient profiles per 1,000kcal, consumers can't understand the data. The information would, again, need to then be transferred to dry matter to be able to compare one test result to another.

mg/100g = the number of milligrams per 3.5oz of product.

mcg/g – the number of micrograms per single gram of product. This may also be listed as ng/g or ppb if the measurement is only 1g.

ppm – this is the number of milligrams per kilogram (35.2oz or 1,000g) of product.

% - this is the number of grams in 3.5 of products (or 100g)

In high-moisture foods, nutrients must be converted to the following units of measure:

Amino Acids – g/1,000kcal

Fats – g/1,000kcal

Minerals:

Calcium, Phosphorus, Potassium, Sodium, Chloride, and Magnesium – g/1,000kcal

Iron, Copper, Manganese, Zinc, Iodine, Selenium – mg/1,000kcal

Vitamins:

Vitamins A, E and D – iu/1,000kcal (use Google to see the different calculations for each iu conversion)

B-Vitamins – mg/1,000kcal

Clearly, this is quite complicated. If you are in possession of product test results and you need help calculating them for analysis, you may email them to Hello@ParsleyPet.com for assistance.

SAMPLE REPORTS – LABORATORY ANALYSIS DONE BY AFL – COMPARISON OF THE SAME SAMPLE, nonHPP and HPP

Converted to Dry Matter (DM) comparison

<u>Nutrient</u>	<u>nonHPP DM</u>	<u>HPP DM</u>
Protein**	66.2%	51.21%

(HPP processing can cause structural changes in proteins, leading to denaturation. Denaturation disrupts the protein's native structure, alternating its functional properties and potentially affecting the accuracy of protein measurements. In addition, some proteins may become less soluble or form aggregates, making them less available for analysis. Denatured and aggregate proteins may be more difficult to detect or quantify using standard analytical methods leading to a lower measured protein content in the HPP sample.)

Fat**	32.17%	28.41%
<i>(HPP can cause oxidative reactions in fats. Oxidation can lead to the degradation of fats and the formation of volatile compounds. These changes in fat composition might affect the accuracy of fat measurements.)</i>		
Fiber**	18.22%	14.86%
<i>(Some types of dietary fiber may be soluble in water, and HPP can potentially lead to changes in fiber solubility. If certain fibers become more soluble during the process, they may be lost in the water fraction or become less quantifiable in the analysis, resulting in a lower measured fiber content in the HPP sample)</i>		
Moisture	69.26%	60.30%
Ash	6.81%	6.80%
Calcium**	0.20%	0.22%***
Phosphorus**	0.232%	0.248%***
Ca:P	0.86:1	0.89:1
Magnesium**	0.02%	0.02%
Potassium**	0.24%	0.25%***
Sodium**	0.072%	0.076%***
Copper**	0.034%	0.4%***
Zinc	0.325%	0.365%***
Iron**	0.0031%	0.0035%***
Thiamine*	0.015%	0.015%
Vitamin B12*	0.0063%	0.0063%
Riboflavin**	0.134%	0.126% (decrease)
Niacin	0.518%	0.571%

(HPP can impact enzyme activity within food products. Some enzymes have the ability to convert precursor compounds into active forms of certain nutrients. If the HPP treatment influenced the activity of enzymes involved in niacin conversion or synthesis, it could result in higher levels of niacin in the HPP sample. This could potentially negatively impact the body's ability to properly metabolize vitamins once the food product containing those altered enzymes is consumed. Enzymes play a crucial role in facilitating biochemical reactions in the body, including the metabolism and activation of enzymes. When enzymes involved in vitamin metabolism are impaired or dysfunctional, it can lead to deficiencies in the active forms of the vitamins or hinder their conversion into active forms that can be utilized in the body. As a result, the body may not be able to effectively utilize or absorb the vitamins from the diet.)

Pantothenic Acid	0.0535%	0.0656% (See niacin summary)
Pyridoxine*	0.0068%	0.0068%
Biotin*	0.0097%	0.0097%
Folic Acid*	0.00557%	0.00556%
Vitamin D2*	0.0011%	0.0011%
Vitamin D3*	0.0011%	0.0011%
Vitamin E*	0.01%	0.01%
Vitamin K2	0.01%	0.01%

* Result was below the limit of detection. This nutrient could be as low as ZERO.

**IMPLIED INCREASE ON ORIGINAL REPORT. MISLEADING INCREASE ACTUALLY CAUSED BY DECREASED MOISTURE CONTENT IN HPP PRODUCT.

***Possible or likely standard deviation laboratory "error" or lack of homogenization in the sample

Keep in mind that laboratory analysis is not as precise as people like to think it is. Mild deviations may be the result of acceptable laboratory deviation. A good lab should be able to tell you the expected deviation % of any single result. Additionally, as previously stated, "loose" nutrients that have been released from destroyed cells may be more visible to machinery. That does not mean nutrients magically appeared out of nowhere. Copper, for example, has a 25% standard deviation, making test results fairly inconsistent in most tests.