Environmental and Industrial Contaminants

Our point of view

Introduction

Clean Label Project was formed with the mission to raise awareness on the presence of dangerous environmental contaminants and toxins in everyday consumer products. Clean Label Project believes that when it comes to environmental contaminants and toxins, less is better than more. Not only are these compounds toxic, but knowledge on the long term effects of exposure to these contaminants is concerning and still developing. As a result, Clean Label Project believes that a serious conversation needs to be had with brands and regulatory bodies on the presence of these contaminants in consumer products. This document outlines Clean Label Project's rationale behind our stance on contaminants in consumer goods.

Definitions and Terminology

What is a contaminant?

Used here, the word "contaminant" refers to any of several compounds or chemicals of environmental and industrial origin that, despite being potentially dangerous, are sometimes inadvertently present in finished products. This could include contaminants like heavy metals, pesticides, as well as man-made substances like bisphenol A (BPA), which is introduced to food products by packaging, and acrylamide, which can be created through the food production process.

What does toxic mean?

Any substance, if given in a high enough dose, can be toxic to living things. Used here, the word "toxic" refers to just that: negative effects that result from exposure to a substance. Even life-essential compounds like vitamins can be toxic in high enough volumes. However, there are many substances that become toxic even in very low quantities – especially when taken repeatedly over a long period of time.

What contaminants does Clean Label Project measure?

Clean Label Project, with the help of an independent third-party analytical chemistry testing laboratory, measures over 130 separate environmental and industrial contaminants, including, but not limited to, heavy metals (e.g., lead and arsenic), pesticides (100+ pesticides), melamine and its analogues, antibiotic- residues, BPA and its analogue BPS, antibiotics, and acrylamides.

How do contaminants wind up in food?

Contaminants may wind up in a finished food product though several routes. Some, like heavy metals, can be absorbed into plants grown in poor quality soil. Some metals (like mercury and arsenic) can be present in high concentrations in seafood where metal contamination builds throughout the life of the fish. Other contaminants are the result of the process of preparing the product: acrylamides can result when starchy foods, like potatoes, are fried at high heat and BPA can be present in food packaging, including plastic packages and metal cans. Still other contaminants have no valid reason for being present in food: melamine and its analogues can be used in in foods to artificially inflate protein content. This contaminant was responsible for killing hundreds of pets in 2007[1]. The important thing to remember is that however these contaminants wind up in pet food, they are avoidable– there is always room for improvement.

clean label PROJECT magnify the best

How does Clean Label Project handle these contaminants?

Clean Label Project believes the best way to effect change on a large scale is through the use of data, science, and transparency. Information asymmetry is an economic term used to represent the imbalance of information between two parties. Clean Label Project uses category testing data to combat this asymmetry by demonstrating how much room for improvement an industry has (be it the pet food industry, baby food industry, etc). As discussed below, regulations on these contaminants are, in many cases, insufficient or (in the case of pet food) entirely lacking. To this end, rather than benchmarking our data against a cut-off value, Clean Label Project benchmarks each product against the rest of the category – meaning that 1 star products fared poorly relative to the rest of the category, not against a cut-off value or limit. However, in the case of a true government standard (e.g., human standards propagated by the EPA, FDA, EU Commission, California Proposition 65) we may include these limits as a part of our standards.

Clean Label Project believes that environmental and industrial contaminants are bad

While some contaminants, like chromium, can be beneficial or even essential in small quantities, the fact remains that all the contaminants Clean Label Project measures can have an adverse effect on health. Heavy metals can be especially dangerous, considering their tendency to build up inside animals[2]. Cadmium has been linked to kidney failure as well as brain damage in mammals[3],[4], lead exposure has been linked to persistent brain, bone, and liver dysfunction in mammals[5], and mercury is a well-known neurotoxin that can accumulate in brain tissue and cause serious neurological problems[6]. These metals are not considered essential to survival[7] and their presence in food does not benefit the long-term health of the animal or person. Indeed, many human regulatory bodies have stated that the goal for many of these toxins is zero.

Of equal concern are man-made contaminants – which are not only toxic but have no valid reason for existing in any quantity within food products. Acrylamide, in addition to being linked to cancer and birth defects in humans and animals, is a cumulative neurotoxin, the brain-damaging effects of which can build up over time[8]. This means that long term exposure to acrylamide could result in progressively worsening symptoms, even with relatively low exposure. Bisphenol A (BPA), a chemical found in plastics and the linings of metal cans, interferes with hormones and can cause neurological issues in mammals[9]. Indeed, dogs fed canned food have shown elevated blood levels of BPA and corresponding changes to markers of kidney and intestinal health[10]. Pesticides run the gamut from relatively harmless to deadly, but all are avoidable in finished food products. As a whole, these contaminants are unambiguously dangerous chemicals that have the potential to cause long-lasting health consequences in living animals. Worse, studies do not generally factor in the additive effects of multiple containments present in the same food product – a food containing cadmium and arsenic together may be worse than a product with either alone.

> *"As a whole, these contaminants are unambiguously dangerous chemicals that have the potential to cause long-lasting health consequences in living animals."*

Notably, these consequences are not hypothetical – we see the fall-out of exposure to these contaminants every day. It has long been known that lead and other heavy metals are directly linked to cancer[11] in animals and humans, an alarming fact when considered alongside our findings that lead levels in pet foods are many times higher than human-grade food (due in no small part to the lack of clear regulation in pet food). This information is particularly compelling when considered alongside the fact that dogs are approximately 10 times more likely than humans to be diagnosed with cancer[12] – a number that is unlikely to reflect the true incidence as many companion animals are not diagnosed with a condition prior to death. Worse, there is some evidence that the rate of cancer in companion animals has increased over

the last fifty years[13], coinciding with the rise in prevalence of commercial pet food, though it is important to note that this could be due to any number of factors (including better diagnosis and increased vigilance). Still, it is troubling to note that canine cancer rates have risen alongside the commercial profile of products we have demonstrated possess alarmingly high levels of multiple known carcinogens.

When it comes to contaminants, less is better than more

Clean Label Project believes that the safest approach to take when it comes to the health and safety of family members is that less contaminant is better than more.

This is important because an accumulating body of evidence suggests that, for many environmental and industrial contaminants, the only truly safe level of exposure is no exposure. In humans, for example, even low-level exposure (i.e., below human regulatory limits) to mercury can disrupt brain development[14].

New evidence suggests that the effects of mercury on developing brains is linear – meaning any amount of mercury can be harmful to growing brains rather than the "all or nothing" system implied by current government or industry regulations[15]. It has been argued by some scientists that, for environmental contaminants like lead, the concept of "safe levels" may be an illusion[16]- instead, our focus should be on reducing or eliminating living organisms' exposure to lead. As the scientific body of knowledge on these contaminants increases, it becomes apparent that "safe" is synonymous with "less." Consider the following data based on the 1999 National Research Council report on arsenic in drinking water[17]:

There is a clear link between the amount of arsenic in tap water

Arsenic Level in Tap Water (in parts per billion, or ppb)	Approximate Total Cancer Risk (assuming 2 liters consumed/day)
0.5 ppb	1 in 10,000
1 ppb	1 in 5,000
3 ppb	1 in 1,667
4 ppb	1 in 1,250
5 ppb	1 in 1,000
10 ppb	1 in 500
20 ppb	1 in 250
25 ppb	1 in 200
50 ppb	1 in 100

and the cancer risk in humans. This data also suggests that, when it comes to cancer, less is better. This pattern also extends to acrylamides, where researchers have argued that there is a risk of acrylamide bioaccumulation in children consuming fried potato chips[18], suggesting once again that less exposure is better than more. For these environmental contaminants, there is unlikely to be a magic cut-off below which exposure to a contaminant carries no risk – and if there is, it almost certainly is not the current regulatory limits.

Knowledge is still developing – and so too should our regulations

Clean Label Project believes that there simply is not enough information on the long-term effects of exposure to these contaminants on living organisms. For example, arsenic is a highly toxic metal that can be found in our environment. Arsenic

clean label PROJECT™ magnify the best

can also bio-accumulate naturally (alongside mercury) in seafood such as tuna. The type of arsenic found in fish is primarily "organic arsenic," which is generally considered to be less toxic than other forms of arsenic. This leads many companies to assume that the organic arsenic in their food products is "harmless." However, that assumption has been challenged by recent developments in science – evidence is emerging that organic arsenic may be transformed inside animals (including humans) that ingest it into more dangerous (and carcinogenic) forms of arsenic[19]. This means that even this so-called "non-toxic" arsenic may increase the incidence of cancer in living organisms. Essentially, as our knowledge of these contaminants increases, we have consistently discovered that these contaminants are more dangerous than previously thought, meaning that it behooves brands to take a proactive approach to reducing or eliminating contamination. With this in mind, and with an awareness that science is an ever-improving, ever-growing discipline, Clean Label Project feels that the safest approach to take when it comes to the health and safety of family members is that less is better.

There needs to be a regulation conversation

A common benchmark used by the pet food industry is the NRC's Mineral Tolerance of Animals[7]. This is an excellent resource that summarizes the available literature on the effects of heavy metals exposure in animals (including domestic animals). However, the NRC guidelines are limited by the information available to the scientific body that wrote them – and there simply haven't been long term studies establishing the effects of low-dose multi-year exposure to carcinogens like arsenic or lead in companion animals. Most literature cited in the NRC report relevant to companion animals concerns exposures less than 12 months in duration. This can cause confusion, with some brands asserting that safety in the short term must mean safety in the long term. Clean Label Project disagrees with this assessment. The NRC limits represent the best consensus of what was available at the time, but much like the toxin limits for humans, we believe that there is room for improvement. It is for this reason that Clean Label Project decided not to use the NRC levels for judging pet food – we believe that the industry can and should set its bar much lower if it is serious about the long-term health and wellness of America's pets.

This same conclusion is applicable to human food as well. As outlined above, Clean Label Project believes that the environmental and industrial contaminants we measure are dangerous to all living organisms. As knowledge improves, the consensus of the scientific community has been that greater restriction is required. Consider the acceptable levels of arsenic in drinking water –the limit in some states has dropped nearly 10-fold in the last 20 years alone[20,21]. This should be the same strategy employed by the packaged food industries – responding to evidence with increased regulation, not denial.

> "...Clean Label Project believes that the environmental and industrial contaminants we measure are dangerous to all living organisms."

References

[1]Rumbeiha, W., & Morrison, J. (2011). A review of class I and class II pet food recalls involving chemical contaminants from 1996 to 2008. Journal of Medical Toxicology, 7(1), 60-66.

clean™ label PROJECT
magnify the best

[2]Sakamoto, M., Kakita, A., Domingo, J. L., Yamazaki, H., Oliveira, R. B., Sarrazin, S. L., ... & Murata, K. (2017). Stable and episodic/bolus patterns of methylmercury exposure on mercury accumulation and histopathologic alterations in the nervous system. Environmental Research, 152, 446-453. Chicago

[3]Ahmed, M. A. (2013). Effect of angiotensin II type 1 receptor blocker on renal function, arterial blood pressure and parathyroid hormone related protein over expression in cadmium induced nephrotoxicity in adult male rats. International journal of physiology, pathophysiology and pharmacology, 5(2), 109.

[4]Haider, S., Anis, L., Batool, Z., Sajid, I., Naqvi, F., Khaliq, S., & Ahmed, S. (2015). Short term cadmium administration dose dependently elicits immediate biochemical, neurochemical and neurobehavioral dysfunction in male rats. Metabolic brain disease, 30(1), 83-92.

[5]Høgåsen, H. R., Ørnsrud, R., Knutsen, H. K., & Bernhoft, A. (2016). Lead intoxication in dogs: risk assessment of feeding dogs trimmings of lead-shot game. BMC Veterinary Research, 12(1), 152.

[6]Farina, M., Rocha, J. B., & Aschner, M. (2011). Mechanisms of methylmercury-induced neurotoxicity: evidence from experimental studies. Life sciences, 89(15), 555-563.

[7]NATIONAL RESEARCH COUNCIL. (2005). Mineral tolerance of animals. Committee on minerals and toxic substances in diets and water for animals, Board on agriculture and natural resources, Division on earth and life studies.

[8]Spencer, P. S., & Schaumburg, H. H. (1975). Nervous system degeneration produced by acrylamide monomer. Environmental health perspectives, 11, 129.

[9]Weinstein, S. D., Villafane, J. J., Juliano, N., & Bowman, R. E. (2013). Adolescent exposure to Bisphenol-A increases anxiety and sucrose preference but impairs spatial memory in rats independent of sex. Brain research, 1529, 56-65.

[10] Koestel, Z. L., Backus, R. C., Tsuruta, K., Spollen, W. G., Johnson, S. A., Javurek, A. B., ... & Bivens, N. J. (2017). Bisphenol A (BPA) in the serum of pet dogs following short-term consumption of canned dog food and potential health consequences of exposure to BPA. Science of The Total Environment, 579, 1804-1814.

[11]Van Esch, G. J., & Kroes, R. (1969). The induction of renal tumours by feeding basic lead acetate to mice and hamsters. British journal of cancer, 23(4), 765.

[12]Schiffman, J. D., & Breen, M. (2015). Comparative oncology: what dogs and other species can teach us about humans with cancer. Phil. Trans. R. Soc. B, 370(1673), 20140231.

[13]Merlo, D. F., Rossi, L., Pellegrino, C., Ceppi, M., Cardellino, U., Capurro, C., ... & Bocchini, V. (2008). Cancer incidence in pet dogs: findings of the Animal Tumor Registry of Genoa, Italy. Journal of veterinary internal medicine, 22(4), 976-984.

[14]Al-Saleh, I., Elkhatib, R., Al-Rouqi, R., Abduljabbar, M., Eltabache, C., Al-Rajudi, T., & Nester, M. (2016). Alterations in biochemical markers due to mercury (Hg) exposure and its influence on infant's neurodevelopment. International Journal of Hygiene and Environmental Health, 219(8), 898-914.

[15]Axelrad, D. A., Bellinger, D. C., Ryan, L. M., & Woodruff, T. J. (2007). Dose-response relationship of prenatal mercury exposure and IQ: an integrative analysis of epidemiologic data. Environmental health perspectives, 609-615.

[16]Vorvolakos, T., Arseniou, S., & Samakouri, M. (2016). There is no safe threshold for lead exposure: A literature review. Psychiatrike= Psychiatriki, 27(3), 204.

[17]National Research council. (1999). Arsenic in drinking water. National Academies Press.

[18]Ouhtit, A., Al-Sharbati, M., Gupta, I., & Al-Farsi, Y. (2014). Potato chips and childhood: What does the science say? An unrecognized threat?.Nutrition, 30(10), 1110-1112.

[19]Molin, M., Ulven, S. M., Meltzer, H. M., & Alexander, J. (2015). Arsenic in the human food chain, biotransformation and toxicology–Review focusing on seafood arsenic. Journal of Trace Elements in Medicine and Biology, 31, 249-259.

[20]https://www.atsdr.cdc.gov/phs/phs.asp?id=18&tid=3

[21]http://www.consumerreports.org/cro/magazine/2012/11/arsenic-in-your-food/index.htm

clean™
label
PROJECT
magnify the best