

# Protein Powder

## *Our Point of View*

### Introduction

Clean Label Project's mission is to raise awareness on the presence of potentially 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 examines the results of Clean Label Project's finding on contaminants found in popular protein powders. Our goal is to highlight that nutritional facts labels and ingredient decks don't tell the whole truth about quality, to focus on what's inside each product to bring truth to the consumer and change the definition of food and consumer product safety.

### Why Protein Powder?

Protein powder is among the most common dietary supplements in the United States, comprising some \$4.7B in sales in 2015.<sup>1</sup> People take protein powder for a variety of health reasons (muscle gain, weight loss, endurance training, or general health), but all reasons are based on the core assumption that protein powder is inherently good for the consumer. At Clean Label Project, we reject the assumption that when it comes to food that safety can be assumed – we prefer to use data and science to uncover the truth behind the market claims.

### How are Protein Powders Different from Other Consumables?

Dietary supplements, including protein powders, do not require FDA approval for their marketing claims, and often include phrases

like “holistic,” “natural,” and “plant-based,” all of which sound healthy, but are not in and of themselves indicative of any standard of quality. Yet there is a halo of built-in trust that surrounds products in the supplement space – people assume that supplements are regulated like drugs, when in fact they are not.

### What was Clean Label Project's Methodology?

Clean Label Project purchased and tested over 130 top selling protein powders based on Nielsen and Amazon's best seller list and supplemented this with top selling products in the natural and organic marketplace. The scope of testing and review included nutritional superiority like protein content and antioxidant activity, as well as industrial and environmental contaminants, which includes heavy metals like arsenic, cadmium, lead and mercury, persistent pesticides, BPA, a known endocrine disruptor,<sup>2</sup> and mycotoxins, which are linked to cancer, reproductive harm, and brain damage.<sup>3</sup>

Clean Label Project worked with an analytical chemistry laboratory to test over 60 brands and 134 products, amassing and benchmarking over 25,000 data points.

### What Contaminants Were Found in Clean Label Project's Protein Powder Study?

Protein powders tested by Clean Label Project had an array of positive results for detectable levels of arsenic, cadmium, lead, mercury, BPA, mycotoxins, pesticides, and residual solvents. The science on the negative effects that ingestion of a heavy metal, even at minute levels, on human health is well-documented.<sup>4</sup> Nearly 75% of protein powders tested had measurable levels of lead, and nearly 33% of products exceeded at least one federal or

state regulatory set for safety<sup>5</sup>. A recent study by Lanphear and colleagues (2018)<sup>6</sup> suggested that as many as 400,000 deaths each year in the United States are attributable to lead exposure, and that even low-level exposure can lead to premature death. This is corroborated by a growing body of literature arguing that when it comes to lead, there is no safe level in food<sup>7</sup>.

BPA, a contaminant where scientific research has established a strong negative impact on the human body as an endocrine disruptor,<sup>8</sup> was found in 55% of the protein powders tested by Clean Label Project. Some evidence suggests that BPA can increase tolerance to insulin, which may be counter-productive for individuals taking protein powder as an aid to athletic training<sup>9</sup>. This is compounded by evidence that BPA may cause issues with metabolism that could lead to type II diabetes<sup>10</sup>.

Perhaps most notably with the protein powders Clean Label Project tested, products with multiple heavy metals and other contaminants present were commonplace. 53 of the top selling products contained elevated levels of BPA, lead, mercury, cadmium, and arsenic.

Interestingly, certified organic products had, on average, twice the level of heavy metals as non-organic products. This was, in part, due to plant-based protein powders, on average, containing the highest levels of contaminants.

Plant based protein powders, on average, were the most contaminated, while egg and whey based protein powders were the cleanest.

## Aren't These Contaminants Regulated?

Surprisingly, no. The focus of food safety is largely placed on physical and microbiological contamination with little federal regulation of dietary exposure to contaminants like heavy metals. However, in recent months, the Government Accountability Office<sup>11</sup>, the Food and Drug Administration and Congresswoman Rosa DeLauro (D-Conn.)<sup>12</sup> have been placing additional focus on testing and regulation on dietary exposure to heavy metals.

While the initial focus is on heavy metal exposure in foods targeting infants and children, the scope of attention is broader to include exposure to other industrial and environmental contaminants across all food categories.

## Where are These Contaminants Coming From?

There are two primary sources for the contaminants discussed above, contaminated soils in which the ingredients are grown, and from the packaging in which the protein powders are sold. In terms of contaminations at the agricultural level, companies can hold their suppliers accountable, and reduce pesticides and other soil contaminants by stricter monitoring of incoming raw materials.

With the packaging, which Clean Label Project believes is the primary source of the BPA found in these protein powders, the room for improvement is significant. BPA has been almost completely removed from packaging for infant formula and other child nutrition products because of the controversy surrounding BPA and consumer demand for its removal. However, Clean Label Project found BPA in over 50% of the products tested, which indicates that it is likely leaching from somewhere in the packaging.

**Table 1:** The Analyte and Testing Instrument Used

Analyte	Instrument For Testing
Arsenic, Cadmium, Lead, Mercury	Inductively Couple Plasma – Mass Spectroscopy (ICP-MS)A
BPA	Gas Chromatography – Mass Spectroscopy (GC-MS)
Mycotoxins and Pesticides	Liquid Chromatography – Tandem Mass Spectroscopy (LC-MS/MS)
Residual Solvents	Headspace Gas Chromatography with Flame Ionization Detection (HS-GC-FID)



## How Does Clean Label Project Measure These Contaminants?

Clean Label Project contracted an independent analytical chemistry laboratory, Ellipse Analytics, to test for Arsenic, Cadmium, Lead, Mercury, BPA, Mycotoxins, Pesticides, and Residual Solvents.

## What Should Content-Conscious Consumers Look For?

Our goal is to educate consumers to see past the flashy marketing by providing accurate and truthful in product content. The most important approach consumers can take from this report is to be a skeptical consumer. Consumers can ultimately drive positive change in the quality of protein powders. Ask questions—and get the answers! Call the manufacturers of the products you purchase and ask them about their ratings. Commend & congratulate the brands that did well, for those that didn't. Ask if they screen their products for heavy metals, BPA/BPS, antibiotics, and the other environmental & industrial contaminants. Demand real answers, not empty reassurances. Talk to your grocery stores. Ultimately, use your dollars and purchasing power as a vote to drive real change. You can also supplement your diet with whole foods – lean meats and legumes and different types of nut butters. For a full list of products Clean Label Project evaluated, please visit the website at [www.cleanlabelproject.org](http://www.cleanlabelproject.org)

## References

<sup>1</sup>"Sports Protein Powder Market Size United States, 2015-2020 | Statistic." Statista, [www.statista.com/statistics/512682/sports-protein-powder-market-size-us/](http://www.statista.com/statistics/512682/sports-protein-powder-market-size-us/).

<sup>2</sup>Wang, H., Liu, L., Wang, J., Tong, Z., Yan, J., Zhang, T., ... & Shen, H. (2017). Urinary sexual steroids associated with bisphenol A (BPA) exposure in the early infant stage: Preliminary results from a Daishan birth cohort. *Science of The Total Environment*, 601, 1733-1742.

<sup>3</sup>Mycotoxins That Can Affect Your Cancer Risk. [beatcancer.org/](http://beatcancer.org/)

[blog-posts/mycotoxins-that-can-affect-your-cancer-risk](http://blog-posts/mycotoxins-that-can-affect-your-cancer-risk).

<sup>4</sup>Winter, A. S., & Sampson, R. J. (2017). From lead exposure in early childhood to adolescent health: A Chicago birth cohort. *American journal of public health*, 107(9), 1496-1501.

<sup>5</sup>California Safe Drinking Water and Toxic Enforcement Act of 1986, Proposition 65.

<sup>6</sup>Lanphear, B. P., Rauch, S., Aulinger, P., Allen, R. W., & Hornung, R. W. (2018). Low-level lead exposure and mortality in US adults: a population-based cohort study. *The Lancet Public Health*, 3(4), e177-e184.

<sup>7</sup>Vorvolakos, T., Arseniou, S., & Samakouri, M. (2016). There is no safe threshold for lead exposure: alpha literature review. *Psychiatriki*, 27(3), 204-214.

<sup>8</sup>Patisaul HB. Endocrine Disruption of Vasopressin Systems and Related Behaviors. *Frontiers in Endocrinology*. 2017;8:134. doi:10.3389/fendo.2017.00134.

<sup>9</sup>Moon, M. K., Jeong, I. K., Oh, T. J., Ahn, H. Y., Kim, H. H., Park, Y. J., ... & Park, K. S. (2015). Long-term oral exposure to bisphenol A induces glucose intolerance and insulin resistance. *Journal of Endocrinology*, 226(1), 35-42.

<sup>10</sup>Le Magueresse-Battistoni, B., Multigner, L., Beausoleil, C., & Rousselle, C. (2018). Effects of bisphenol A on metabolism and evidences of a mode of action mediated through endocrine disruption. *Molecular and cellular endocrinology*.

<sup>11</sup>United States, Government Accountability Office, "Food Safety: Federal Efforts to Manage the Risk of Arsenic in Rice." Food Safety: Federal Efforts to Manage the Risk of Arsenic in Rice, 16 Mar. 2018. [www.gao.gov/products/GAO-18-199](http://www.gao.gov/products/GAO-18-199)

<sup>12</sup>"DeLauro Urges FDA Action to Address Arsenic in Infants' Food." Congresswoman Rosa DeLauro, 16 Apr. 2018, [delauro.house.gov/media-center/press-releases/delauro-urges-fda-action-address-arsenic-infants-food](http://delauro.house.gov/media-center/press-releases/delauro-urges-fda-action-address-arsenic-infants-food).