



An Informational Guide About Glyphosate Testing

Interviews with third-party certifications, brands and laboratories

Q1-2019 Special Report for Premium Subscribers of Organic Insider

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If you know anyone that would benefit from reading this report, please ask them to sign up for a premium plan of Organic Insider and they will receive a copy of it. This will help support the work that we are doing each week. For disclosure purposes, Max Goldberg, founder of Organic Insider, has been a marketing partner of The Detox Project since 2017.

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OVERVIEW

Despite the fact that glyphosate -- one of the most toxic herbicides in the world and a chemical that is known to the State of California to cause cancer -- is banned in organic, this does not mean that organic crops are free from it. The unfortunate reality is that glyphosate contamination of organic farms is a real issue, with some crops more at risk than others.

Since the USDA's National Organic Program does not mandate that participants in the organic sector test for glyphosate, there is no formal protocol as to how industry stakeholders should handle this issue. As a result, a sector dedicated to glyphosate testing has emerged, and brands have been forced to navigate this terrain on their own.

For organic companies who are interested in testing but may be unfamiliar with many of the marketing and technical challenges surrounding glyphosate testing, we hope that this report may be of assistance. We have garnered opinions, perspectives and information from third-party certifications, brands that use a third-party certification, brands that do not use a third-party certification, and testing laboratories.

We are not making any recommendations about strategies or services that a company should use but hope this information provided here will make it easier for a brand to pursue glyphosate testing since it is such an important issue and consumer awareness about the health risks of this chemical has never been greater.

THIRD-PARTY CERTIFICATION – THE DETOX PROJECT



Website: <https://detoxproject.org/>

Contact information: info@detoxproject.org

Answers by Henry Rowlands, Founder

How long has the certification been in business?

The Detox Project launched Glyphosate Residue Free certification in the summer of 2017.

How many brands are currently certified?

There are currently 30 brands certified with over 200 products. We expect 50 brands to be certified before summer 2019.

Which ones?

A list of the brands and certified products can be found at: <https://detoxproject.org/certification/glyphosate-residue-free/>

How does the process work and how long does it take to get certified?

Brands test their products at third-party laboratories that meet the certification standard's requirements for the use of gold standard testing methods.

As soon as the brands receive results from the laboratory, they share them with us and we review the required documentation for the certification to be granted. This process takes two weeks after we receive the documentation.

Brands have to test all of their certified products a minimum of 3 times per year.

What are the fees associated with becoming certified?

The annual certification fee is \$1,472 and the testing costs at third-party laboratories are an estimated \$200 per sample.

What happens if the food product becomes contaminated once the product is already certified? Do you pull the certification?

This has not yet happened with any of our certified brands, but if it does, there is a process established to help the brand react to any supply chain issues. If the brand does not react as required, the certification would be removed from any specific product with glyphosate contamination.

Are there thresholds for each food category or is there a zero tolerance for any glyphosate contamination?

We have a zero tolerance for glyphosate contamination based on globally recognized laboratory Limit of Detection (LOD) protocols for pesticides in food, which is usually 10 parts per billion (10 ppb). This is also the default Maximum Residue Limit for pesticides in food in Europe and Japan. The reason is that lab testing for most food and supplement products is reliable at this LOD.

There is much competition between laboratories now to state that they have lower LODs, but we will stick with reliable LODs until new methods are proven to be reliable over a period of time by multiple laboratories. If a brand is testing products using third-party laboratories, which use reliable methods with reliable LODs, everyone should be happy given that 10 ppb is a very low level (less than a small drop in an Olympic size swimming pool).

How has the marketplace responded to your certification?

There has been significant interest since we launched. At first, this was in the form of inquiries from hundreds of brands without many of them taking the full step to certify their products. However, since the summer of 2018, we have seen brands start to follow through and certify their products.

We have also acted as consultants for over 500 brands (some very big, some small) to improve their glyphosate and other pesticide testing processes within their supply chains.

Why is it important that companies become certified rather than just do glyphosate testing on their own?

Consumers currently rely on third-party certification for trustworthy transparency. Background testing in supply chains is important for brands to do, but forward-facing final product testing and certification is the only way to be fully transparent.

The transparency movement is here to stay, and brands really do need to catch up fast!

What should companies know about glyphosate testing and what are the most common questions about glyphosate testing that you are asked?

Companies should make sure that the laboratories they are using have been in business for more than five years in order to ensure reliability of methods.

Specifically regarding glyphosate testing, they should make sure that the LODs of the methods used are low and that the method is gold standard - liquid chromatography-tandem mass spectrometry (LC-MS/MS), not ELISA.

I am often asked what the high-risk ingredients are and always answer that oats, pulses, wheat and some fruits are the most high risk. However, we have seen glyphosate in a wide range of other ingredients, too.

THIRD-PARTY CERTIFICATION – BIOCHECKED



Website: <http://biochecked.com/>

Contact information: admin@biochecked.com

Answers by Scott Prentice, Executive Director

How long has the certification been in business?

BioChecked has been in business since 2012, and we launched BioChecked Non Glyphosate Certified™ in 2015. It wasn't until 2016, when it was officially launched, that we became really excited. We knew from our first day in business as a certifier that this particular certification was going to be a hit.

We had to launch the Non GMO certification first because that was a growing trend, and we had to follow that because the people were demanding it. Yet, we knew all along that glyphosate contamination that was the larger problem.

How many brands are currently certified?

BioChecked has approximately 120 clients, and several have over 60 or more products under our seals. Some also have all three, which includes Non Gluten Verified™

Which brands?

We have several clients that have asked us to sign non-disclosure agreements because of ingredient lists, etc. So, we have made it our policy not to post the actual lists of our clients or their products. We will, however, post joint press releases of new product seals if the client specifically asks.

How does the process work and how long does it take to get certified?

Our process of certification is actually quite simple. Since we are the third set of eyes or an independent third-party to this process, we require that the client sends the product to an approved lab. The client will directly receive the results and will then forward them to us. As soon as we receive the results, we'll then review them to make sure they meet our standard of Non Glyphosate, which is posted in our agreement and online.

The client must meet and maintain this standard for the next year and through the renewal period. We may request a spot check at anytime throughout the year if we believe there may be an issue. The client has the option to run as many tests as it believes necessary to maintain the certification.

What are the fees associated with becoming certified?

Initial program registration for the first year for each business is \$1,200 with an annual renewal of \$600. Each individual product filing/certification is an additional \$150 with an annual renewal of \$75.

What happens if the food product becomes contaminated once the product is already certified?

Foods can become contaminated after they have already received certification. A company will have 30 days to rectify the problem through a change of product or supplier. If this cannot be fixed, the company can lose certification, and the product would have to be pulled from the shelves.

Are there thresholds for each food category or is there a zero tolerance for any glyphosate contamination?

Our standard is for all food and skin products. This standard is not based on categories of food or different products.

How has the marketplace responded to your certification?

We have become extremely excited by producers who have discovered us online and through referrals. The general public is becoming more and more educated about what is in their food, and glyphosate is becoming the number one problem in our food chain.

Why is it important that companies become certified rather than just do glyphosate testing on their own?

I could write a novel on just this one question. The simple answer is if you want to connect with the consumer on real health issues, you speak to them on your label.

This certification has more to do about saving human lives than selling a brand that generates revenue. The producers that are asking for this certification are very aware of their customers and their needs. They are already changing to or designing products that are consumer-safe.

What should companies know about glyphosate testing and what are the most common questions about glyphosate testing that you are asked?

The two questions we get asked the most are how long the process takes and the cost.

We are always very transparent in our business practices and have designed a good pricing structure for our producers that won't affect the cost to consumers. Our standard is published online, and our certifications are backed up by strong laboratories and testing guidelines.

BRAND – FOODSTIRS (CERTIFIED BY THE DETOX PROJECT)

Answers by Greg Fleishman, Co-Founder and Chief Operating Officer

Website: <https://foodstirs.com/>

When did you first start testing for glyphosate and why?

We started in September of 2018. Clean food reassurance is a cornerstone of Foodstirs' mission and brings the deepest form of transparency.

Do you test for all of your products? If not, which ones do you test for and are you planning on testing them all at some point in the future?

Yes, we have tested all of our products and are the first nationally distributed food brand to have total portfolio certification.

Has glyphosate testing (i.e., high test results) caused interruptions or changes in your supply chain? If so, please explain.

No, because we use only organic, Biodynamic and Single Origin Identity-Preserved ingredients, all of which helps keep the testing for glyphosate relatively straightforward.

You chose to become glyphosate residue free from The Detox Project. Why?

It is important that our third-party certifier be credible with the highest testing standards. The Detox Project is the only certifier that requires the deepest residue testing.

How have consumers responded to Foodstirs receiving Glyphosate Residue Free Certification? How much of a difference do you think this has made for the company, in terms of attracting new customers and with buyers at retail?

It is still new and gaining awareness. Yet, we are seeing positive results so far with our customers, and many are relieved to know that Foodstirs offers this level of transparency.

What should brands know when they are thinking about testing for glyphosate? What advice would you give them?

The most important thing is to start with an ultra-clean supply chain. Biodynamic and Single Origin Identity-Preserved offer the purest form of agriculture and are a giant step towards glyphosate residue free.

For brands that are not currently testing for glyphosate, why should they be doing this?

Consumers demand transparency, particularly around harmful chemicals. With the recent press around this issue, that demand is only going to increase further.



BRAND – ONE DEGREE ORGANIC FOODS (CERTIFIED BY BIOCHECKED)

Answers by Stan Smith, Co-Founder

Website: <https://onedegreeorganics.com/>

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When did you first start testing for glyphosate and why?

Our discipline is to visit every farm that we source from and understand what we can about each crop.

In 2015, I was at a farm in Canada that was growing wheat for us and wanted to know why organic wheat was more expensive than conventional wheat. The farmer pointed out that in an organic harvest, you have to lay wheat on the ground and let it dry until nature does its job. On the other hand, at a conventional farm, they will spray it with glyphosate seven days prior to harvest as a desiccant.

Previously, my understanding was that glyphosate was solely connected to GMOs, and I thought that non-GMOs did not get exposed to glyphosate. So, this was a learning for me.

In 2016, we started the process of doing our own testing for glyphosate, but there was no third-party testing agency at the time. So, we sent samples of crops to labs and have been doing it ever since. In 2017, we found BioChecked, a third-party certification, and were one of its first clients.

Do you test for all of your products? If not, which ones do you test for and are you planning on testing them all at some point in the future?

Yes, some may not have the logos on the packaging, but we do it for all of them.

Has glyphosate testing (i.e., high test results) caused interruptions or changes in your supply chain? If so, please explain.

Yes, we had an issue one time -- a cereal made with oats.

We choose oat farms very carefully, and the location of this one farm was such that there was a very low probability of cross-contamination. Yet, the product came back with significant amounts of glyphosate. We assumed that it was the oats, but the problem was actually the certified organic garbanzo beans, which were not grown in North America. Fortunately, we caught this early in the process and pulled it from the manufacturing facility.

This was a real surprise to me, as we didn't expect garbanzos to be as vulnerable. But this just shows how many foods we eat are contaminated.

How does the company display its test results and how often do you test your products?

We use the BioChecked seal on our products. We test every lot of ingredient on our own initiative. If there are measurable amounts, you have crossed the line. BioChecked does not allow that.

Which lab do you use and what should companies look for when choosing a lab?

We use SGS Canada Inc.

For companies that do their own testing, it is important for them to understand the parameters that the lab uses and how accurate they are. Some go to .0001, and some are 10x more granular than others.

What would you tell people about existing glyphosate testing technologies?

Labs use different methods, and there are different levels of accuracy. There is a margin of error that gets debated. Some labs come back with a negative result and when they test again, it is fine.

You chose to become glyphosate residue free from a third-party certification. Why?

Customers appreciate the assurance of knowing that it is more than the marketing department making a claim. Instead, another entity is verifying this claim. It is important for credibility, transparency and customer assurance.

What should brands know when they are testing for glyphosate? What advice would you give them?

Glyphosate is becoming an item of high awareness among consumers, and certifying does build customer confidence. However, testing requires a commitment, and glyphosate can show up in products that you don't expect. So, you need to ask yourself: what's your commitment to this? For us, it is zero tolerance. If our product has a measurable amount, we pull it.

It is important to stay close to your suppliers, and we buy ingredients from a farm, not a pool. As a result, there is a higher likelihood that product is isolated and not co-mingled.

For organic brands that are not currently testing for glyphosate, why should they be doing this?

The high risk of cross-contamination. There has been some news about organic brands having measurable amounts of glyphosate showing up in their products. These are good,

respectable brands. It just shows how hard it is to have clean ingredients. Measuring it allows for assurance, and organic consumers respect that.



BRAND – ZEGO FOODS (NO THIRD-PARTY CERTIFICATION)

Answers by Colleen Kavanaugh, Founder

Website: <https://zegofoods.com/>

When did you first start testing for glyphosate and why?

I started a few years ago when the test for glyphosate was pretty new, and The Detox Project was looking for American companies to become glyphosate-free certified.

At the time, ZEGO made only our nutrition bars (we now make oats, muesli, protein powder and mix-ins as well). Our Just Fruit and Fruit+Chia bars are conventional, but our Seed+Fruit bars are organic. I assumed our organic ingredients would be fine but wasn't sure what we would find in our conventional fruits. We deliberately source our fruit from the Pacific Northwest because farmers in that region tend to use fewer chemicals on their crops. This is due in part because their hard winters kill off many of their weeds, which makes herbicides less necessary. Still, I was anxious to see if our theory would hold and those results would be clean. But when the results came back, though, I was nonplussed.

Of everything we tested, it wasn't the fruit we needed to worry about at all. It was the organic cinnamon! It was the equivalent of approximately ten times the glyphosate (nearly 50PPM or parts per million) you would expect to find in GMO soy (by some measures 5PPM). GMO soy is a crop designed to be doused with Roundup. That's an extraordinary amount of glyphosate.

Do you test for all of your products and how much of a financial commitment is it?

Yes, we test all our of our products and any new ingredients or new suppliers. The testing costs about \$300, so it's not insignificant. You definitely have to balance the cost to the consumer with your testing frequency. There's no point in putting a pure product on the market if no one can afford to buy it.

Has glyphosate testing (i.e., high test results) caused interruptions or changes in your supply chain? If so, please explain.

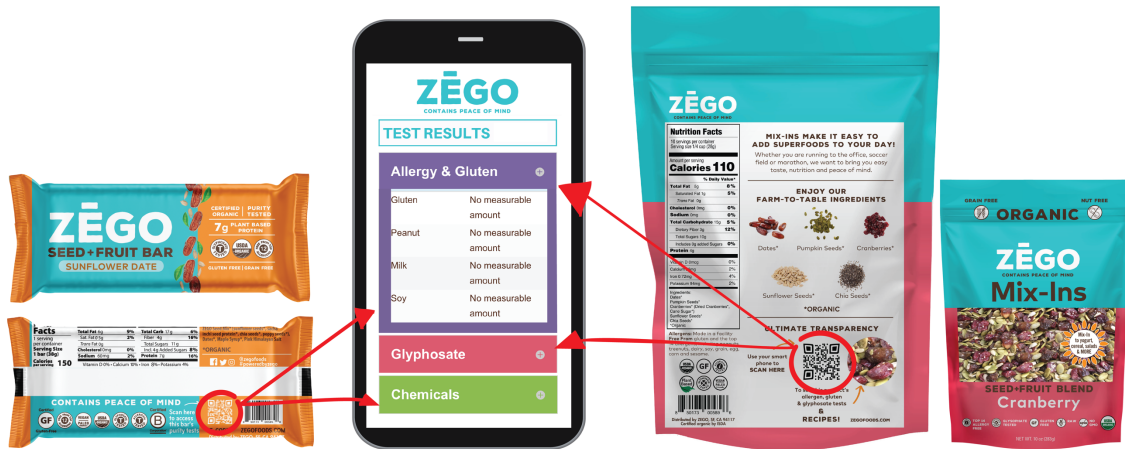
Yes, we changed to a new supplier for our organic cinnamon. Luckily, we haven't had to make any other changes because we research our potential suppliers carefully and talk with them about glyphosate and the farms they buy from.

For example, all of the farms that grow oats in the area that we buy from, whether conventional or organic, sign contracts that they won't use Roundup. So, when we tested for glyphosate in our oat products, we were not surprised that all the tests were clean. It's critical to build relationships over time with trusted suppliers.

How does the company display its test results and how often do you test your products?

We post our results on our website under the Food Safety section. But that’s not very practical for most people because they want to see the information when they are in the store evaluating what brand to purchase. Searching for information on a website with your phone is difficult. That’s why we developed our T-Code food safety system. People can just scan the QR code on any ZEGO package and it will bring you directly to that product’s test results.

We test after each harvest and do random combined tests during the year. For example, we might test all our fruit bars at once since they have similar ingredients. This helps us keep the price down for the consumer.



Scan any ZEGO product’s QR “T-CODE” to see its purity test results and find them on our website www.zegofoods.com

Which lab do you use and what should companies look for when choosing a lab?

We use AGQ Labs in California. When we first started doing glyphosate testing, I believe they were one of only two labs in the country that did it (and the other company’s equipment was out of service at the time). We love AGQ. They are very accessible and thorough. Most of the labs charge around the same price, so I would look for one close to your facility. As a food company doing regular testing, you’ll be mailing a LOT of samples, and it is nice to minimize the mailing time.

What would you tell people about existing glyphosate testing technologies?

There are some home test kits available from The Detox Project, which are great. You can test for specific samples like water and honey. However, you can’t use these to test for everything in your kitchen.

If you want to test a food product, you'll need to send it to a lab. Keep in mind that you can ask the lab to test several items together to save money --I call it the blender model. For example, you take samples of all your organic staple pantry items and have them tested as a group for \$300. If the test shows no measurable amount, you know they are all good.

You choose not be glyphosate residue free from a third-party certification. Why not?

I love what The Detox Project is doing and support anyone's decision to get certified. Right now, we are not certified for a few reasons.

First and most importantly, since I am publishing my results, consumers don't need a third-party certifier to read and confirm our test results. I also test for many things beyond glyphosate (allergens, gluten, etc.) and the badge system we've developed allows us to display that in a way that is easy for busy consumers to understand. It's a great communication tool.

Second, certifications are expensive and glyphosate residue free is especially so because it requires testing of all products three times a year, regardless of risk level.

I want to show companies that even if they can't afford certification, there is another way to do better -- just test when you can afford to and publish your results. Your packaging can tell people you test and direct them to how to find the results. Doing better is much preferable to doing nothing!

What should brands know when they are testing for glyphosate? What advice would you give them?

Suppliers, even co-ops, sometimes buy lots from another supplier when they run out. You may think you are getting apple puree from Washington, but they may have filled your order from Virginia farms or from China. Make sure you confirm the origin of your ingredients every time.

Also, check to see what the most common chemicals are used on the food you buy. If glyphosate isn't the main concern, be sure to test for what is. For example, our conventional fruit bars measure no residue of glyphosate but you wouldn't expect them to. Putting a claim about glyphosate to suggest they are pure is a bit disingenuous.

With fruit, yes. I want to measure to confirm there is no glyphosate, but I'm more concerned about the fungicide captan and other chemicals. That is why we measure for over 400 different pesticides and herbicides, and report all those results as well. Organic plant-based protein powders may not have glyphosate, but they may have high levels of lead and arsenic. We measure for that, too.

If we use “glyphosate free” as a proxy for food purity, we are setting ourselves up to have other toxic chemicals or metals take its place. Then it’s Groundhog Day. New plaintiffs, new cancers, new toxins to fight.

Let’s win the battle on glyphosate and let’s win the war to make our food supply as clear of chemicals and metals as possible.

For organic brands that are not currently testing for glyphosate, why should they be doing this?

Be sure to test your organic ingredients, especially your spices and quinoa. It’s not common, but there is fraud in the organic market. You and your customers shouldn’t be paying a premium for conventionally-grown food.

Generally, ZEGO’s organic ingredient tests show no measurable amounts of glyphosate or any of the 400+ chemicals we test for. But sometimes you find a surprise. If you do, report it to the supplier (get your money back!) and pressure them to eliminate that fraud from their supply chain. Ask them to investigate and provide you with a report of how the fraud got into their system and what they are going to do to prevent it from happening again. They may refuse to do and that will tell you all you need to know about whether you should trust them for future business. This will do more than the government will ever do to quickly find organic fraud and eliminate it.

And, for heaven’s sake, if a broker tells you “If I can’t find it organic in the U.S., I can always get it from Turkey,” which is a classic response, put in the contract that you won’t pay them until you have a lab verify it is organic! If companies work together to test and report, we can bring about a cleaner food system in a relatively short period of time.

BRAND – GF HARVEST (NO THIRD-PARTY CERTIFICATION)

Answers by Seaton Smith, Founder

Website: <http://glutenfreeoats.com/>

When did you first start testing for glyphosate and why?

When we started our company in 2003, we found out about the common practice in some farming areas of using glyphosate to force the oat plant to die for a controlled harvest. We were very surprised at this practice and never allowed this process of harvesting to be used on any of our products since our company was founded.

The areas we grow in allow us to either turn off the water or swath (cut and lay it down on a raised stubble about 6-8” off the ground to dry) the oats for harvest, so no chemicals are used for the harvest. We have been trying to tell people for years that our oats are different. We do not process any oats that we have not been personally involved with from contract, field inspection, harvest, cleaning and finally packaging. This is different from other oat milling companies who just buy commodity oats from ‘who knows where the seed came from or the path it took to the mill’ nor have a personal relationship with each of the growers

We started testing for glyphosate in 2018 when the FDA approved the test for oats. We wanted to verify that our oat products are free from glyphosate.

Do you test for all your products and how much of a financial commitment is it?

The FDA released the glyphosate testing protocol for oats in 2018, so we started testing grain samples from each grower. Since the testing for glyphosate is so new, only a handful of labs can perform the third-party testing. Our current third-party lab charges over \$250 per test. That is a significant cost for one test. With multiple growers, the cost adds up quickly.

Has glyphosate testing (i.e., high test results) caused interruptions or changes in your supply chain? If so, please explain.

Due to the fact that we are directly involved with all of our oats from planting to package, we know what is going on the oats, so this has not been an issue.

How does the company display its test results and how often do you test your products?

For now, if a customer contacts us about glyphosate, we can email our results to them. We are currently putting together a policy for sharing our testing to the public. At this

time, we have found an in-house test that we can use randomly, and we will use a third-party lab to verify on a quarterly basis.

Which lab do you use and what should companies look for when choosing a lab?

We are using Silliker/MerieuxNutriSciences, but we must ship our samples to their lab in British Columbia, Canada. They need to use the method set by the FDA and EU Ref Lab for SRM (Selective Residue Method).

What would tell people about existing glyphosate testing technologies?

Glyphosate testing was developed in 2016 but limited to soybeans, eggs, corn and milk by the FDA. The testing was released to include oats in 2018, so the results have been very limited, and many foods don't have an approved procedure at this time.

You choose not be glyphosate residue free from a third-party certification. Why not?

This is the first year that we have been approached about this type of certification, so that is why we have not invested in a certification agency at this time.

We understand that some certification companies have more credibility than others, and we want to make sure that if we go with a certification company, that it is very reputable and is meaningful to our customers.

At this time, we are following all of the steps that the certified companies do, and our motto is "Faithfully and Ferociously..." Ethical practices are the reason people trust and use our products. We have a history of investing in the right kinds of certifications but are also very sensitive to the fact that every certification fee gets passed on to the end-customer, so we are also trying to be as frugal as possible.

What should brands know when they are testing for glyphosate? What advice would you give them?

We all need to take responsibility for our food supply. We can't let profit and lawyers make the decisions for us. Using a statistical average to allow a known high reading to pass through -- combined with other lower results -- is not ethically correct. It is either good or bad. In other words, you are either pregnant or not. So, if you do the testing, you must be sure that you are prepared for the results.

For brands that are not currently testing for glyphosate, why should they be doing this?

Now that this practice and the issues are better understood, every company that uses oats in their products needs to take responsibility to protect their products and customers. We don't produce or sell anything we would not want to eat ourselves. We have enough other junk going on in our bodies that we don't want to add more issues.



TESTING LABORATORY – AGQ LABS

Answers by Patrick Brennan, Food Safety Sales Director

Website: <https://agqlabs.us.com/>

Contact information: foodsafety@agq.us.com

How does your glyphosate testing process work and how long does it take?

AGQ receives a wide variety of food, supplements, ingredients and other agricultural products for glyphosate analysis.

The process starts by taking a sample of whatever it is the client is interested in testing, properly labeling the sample, filling out a chain of custody form, and sending the sample to AGQ or another third-party lab which has glyphosate analysis included under their ISO-17025 accreditation.

When the sample is received at the lab, we use the chain of custody form to ensure that we register the sample under the correct account and that we include any traceability information that needs to be included on the final report. Once the sample is properly registered, it is assigned a barcode sticker and transferred to the lab. Lab personnel scan the barcode, and from there, they know what type of analysis is being requested and how to begin sample preparation.

The turnaround time for glyphosate analysis at AGQ Labs is 3-5 days. Once analysis is complete, a report is sent to the client.

What are the fees associated with testing?

Depending on the number of samples a client is sending per year, glyphosate analysis can cost anywhere from \$200-250 per sample.

Could you please explain your testing methodology? Why do you use this testing protocol/technology versus others in the marketplace?

Our ISO-17025 accredited method for glyphosate analysis involves an extraction of the sample with water, which is safer than other volatile solvents used in other applications.

It also involves a derivative of the sample to ensure the proper identification of glyphosate since it's a polar compound that is challenging to detect with certain instrumentation. LC-MS/MS is the instrument used to analyze glyphosate. This allows us positively identify the compound by using the parent mass and the daughter mass for glyphosate to prevent false positives.

What should companies know about glyphosate testing and what are the most common questions about glyphosate testing that you are asked?

The most common questions we get are "Is glyphosate included in the multi-residue screen?" and "why not?".

Most organic and conventional producers use multi-residue screens which test for hundreds of different pesticides in order to determine organic or MRL compliance in regards to pesticides. Companies should be aware that glyphosate is not typically included multi-residue screens and that they need to specifically request for glyphosate analysis. The main issue this causes is that companies tend to just assume that glyphosate is automatically included in their multi-residue screen, which can lead to a false sense of security if they are not paying close attention. AGQ does its best to inform its clients that they need to specifically request glyphosate analysis and that they must be aware that it is not included in the multi-residue screen.

There are many reasons why glyphosate analysis is not compatible with broad multi-residue screens. Two of them are: 1) the extraction is different and 2) glyphosate adheres to glass, so the lab must use all plastic lab-ware.

Could you speak to current glyphosate testing technology and how you see it evolving?

Glyphosate testing is always evolving. There are difficulties analyzing complex matrices, and there's always improvement in sample clean-up methodologies for better analysis and faster turnaround times.

TESTING LABORATORY – HEALTH RESEARCH INSTITUTE LABORATORIES (HRI LABS)

Answers by Larry Bohlen, Chief Operating Officer

Website: <https://hrilabs.org/>

Contact information: contacthri@hrilabs.org

How does your glyphosate testing process work and how long does it take?

HRI Labs uses high performance liquid chromatography coupled with mass spectrometry (HPLC-MS) to detect both glyphosate and its main metabolite AMPA in one test.

HPLC separates the sample into individual compounds. Human serum or a complex food can contain from 600 to 1000 different compounds. After separation, samples are fed into the mass spectrometer where the amount of each compound is measured and identified based on its mass and charge. In a pinch, we can turn a sample around in 4 days, but our routine turnaround time varies from two to four weeks, depending on the volume of samples received and the complexity of the sample.

Could you please explain your testing methodology? Why do you use this testing protocol/technology versus others in the marketplace?

The HPLC-MS test method is considered the gold standard for testing by analytical chemists because it is more accurate and more sensitive than other methods like ELISA. By precisely measuring the mass of each molecule that passes through our detectors, HPLC-MS is able to distinguish one compound from another and to quantify the levels in a sample. For example, our limit of detection for glyphosate in various foods ranges from 0.020 to 0.050 parts per billion – the most sensitive of any test on the market.

HPLC-MS costs a bit more than other methods, but if you want to avoid false positives and false negatives, it is the best choice.

What are the fees associated with testing?

Water and urine testing is \$99 per sample. Food, drinks, and soil take a lot more time and materials to test, so the cost is \$275 per sample. There are some efficiencies in testing larger groups of samples, so when many samples are submitted at once, we share the savings with the customer.

What should companies know about glyphosate testing and what are the most common questions about glyphosate testing that you are asked?

One thing companies should know is that glyphosate shows up in some unexpected places. It is in non-GMO foods like oats, wheat, beans, and occasionally even in organic.

We have detected it in foods like orange juice, cranberries, coffee, chocolate and wine – foods that come from plants which are never sprayed directly with glyphosate. We also find it in human and pet hair.

A common question is “where did the glyphosate detected in my product come from?” Another question is, “How do we isolate the source of glyphosate contamination?” especially if it is found unexpectedly. Based on years of experience, now, we can provide useful answers to these questions.

Lastly, many people ask, “What level of glyphosate is a health concern?” This is a controversial topic.

It is well established that high levels of exposure -- direct contact on multiple occasions -- can cause cancer such as Non-Hodgkin’s lymphoma. Chronic exposure through the diet or environment is still under study, and one study in lab animals showed that chronic exposure to as little as 0.1 parts per billion can cause fatty-liver disease (cirrhosis of the liver).

California’s Prop 65 set a threshold of about 500 ppb, which they claim reduces the risk of cancer from chronic exposure to 1 person in 100,000. We would feel safer with thresholds 100 times lower, which are the levels typically found in organic products.

Then, there is the EPA, which has set maximum residue limits as low as 100 ppb for some foods like pineapples and as high as 30,000 ppb for other foods like oats. Why a commonly consumed food like oats is allowed to have levels so much higher than a less commonly consumed food boggles the mind! These limits certainly have little to do with safety, and more likely are based on what is convenient for commerce, since they correspond roughly to the levels typically found in a given crop.

Could you speak to current glyphosate testing technology and how you see it evolving?

Several companies have or are developing dipstick tests that can be used to screen simple foods like grain and flour. These are packaged in little cassettes and work like a pregnancy test. They are much less sensitive and less accurate than lab tests with detection limits between 20 and 50 parts per billion in food. However, they are useful, particularly for grain companies. Progressive companies that have become aware of the glyphosate issue use them to screen every truckload of grain and reject loads that have high levels of glyphosate. Before selling, they confirm purity of each lot with an HPLC-MS test, which gives them a certificate of analysis that will satisfy any customer or regulator.

TESTING LABORATORY – EUROFINS ABRAXIS

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How does your glyphosate testing process work and how long does it take?

Abraxis has two different immunoassay-based formats for glyphosate detection.

- 1) An ELISA (Enzyme-Linked Immunosorbant Assay) using a 96-Well Microtiter Microplate for quantitative detection – a format commonly used by laboratories for chemical or biological assays. This testing process requires modest laboratory technical skills, such as pipetting, and the use of a reader to determine color change intensities in the plate to determine concentrations compared to standards. From sample prep through analysis, this test can be performed in approximately 2.5 hours, with two hours of that time being various incubation steps.
- 2) A Lateral Flow Strip test (similar to home pregnancy tests) for semi-quantitative detection (above/below various levels) or qualitative detection (presence/absence). This format is designed for use either in a laboratory or remote/home setting for screening purposes.

Could you please explain your testing methodology? Why do you use this testing protocol/technology versus others in the marketplace?

Abraxis' testing methodology is based on immunoassay. The advantage of this method is that it does not necessarily require expensive laboratory equipment, allowing for accurate results to be generated onsite for faster decisions at a lower cost.

What are the fees associated with testing?

Customers simply purchase the test kits to meet their specific testing needs. No additional fees.

What should companies know about glyphosate testing and what are the most common questions about glyphosate testing that you are asked?

The most common questions that we are asked are regarding applications and use – which foods, crops, etc. can be tested with our immunoassay kits.

Could you speak to current glyphosate testing technology and how you see it evolving?

As the regulations continue to evolve, so will the testing technologies. Testing will likely move further upstream from the producers to the suppliers — requiring more rapid but still accurate and reliable testing — in order to keep supplies moving.

A number of producers are already using immunoassay technologies for tests such as those for mycotoxins, so some familiarity and workflows are already established. The drive for more organic raw materials will allow for commodity differentiation through such testing.