



INTERPRETIVE GUIDE

IgG Food Explorer™

Our mission: to deliver innovative, accurate and clinically relevant diagnostic testing in a timely and cost-effective manner



FOOD EXPLORER



FIRST OF ALL THANK YOU FOR CONSIDERING US!

"At Diagnostic Solutions Laboratory, we're not content with the range of clinical testing currently available to practitioners. We believe that every patient should achieve optimal health, and we're driven to give clinicians the tools to do so. Our mission, therefore, is to use our resources to bring the most advanced, innovative, and clinically relevant testing to healthcare providers worldwide."

Tony Hoffman
CEO

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IgG FOOD EXPLORER™ INTRODUCTION

WHAT IS IgG FOOD EXPLORER?

The IgG Food Explorer™ is an ELISA-based multiplex food sensitivity test that measures total IgG antibodies to 283 food antigens.

The results from this test can provide insights into a number of gut-related and extraintestinal symptoms and can help practitioners design individualized elimination diets.



HOW TO READ THE REPORT



QUANTIFYING IgG ANTIBODIES

IgG Food Explorer is a quantitative test that measures total IgG antibodies to specific food antigens. Most antigens on the test are raw, organic extracts. Raw antigens allow for preservation of antigenic proteins. The test also includes molecular antigens for dairy and wheat, offering enhanced sensitivity to these highly immunogenic foods.

Antibody response to foods is exposure-based, meaning the patient needs to consume the food regularly for the most accurate results. Elevated antibodies indicate an IgG-mediated immune response to that particular food. Foods are categorized by color according to the level of immune response. Green indicates a low IgG level, yellow indicates an intermediate IgG level, and red indicates a highly elevated IgG level. The report quantifies the individual antibody result to provide greater insight into the level of immune response within the green, yellow, and red categories. The higher the antibody result, the higher the immune response.

0 - 9.99 µg/ml



Low IgG level

10 - 19.99 µg/ml



Intermediate IgG level

> 20 µg/ml



Highly elevated IgG level

Figure 1. IgG Food Explorer Interpretation Key: Stratification of Antibody Result.

CATEGORIES INCLUDED ON THE IgG FOOD EXPLORER



- Milk & Egg (17)
- Meat (14)
- Fish & Seafood (37)
- Cereals & Seeds (29)
- Nuts (13)
- Legumes (10)
- Fruits (36)
- Vegetables (51)
- Spices (31)
- Edible Mushrooms (6)
- Novel Foods (21)
- Coffee & Tea (9)
- Other (9)

SPECIFIC WHEAT/GLUTEN ANTIGENS

Wheat-Specific Gluten Antigens

- Durum wheat
- Einkorn wheat
- Emmer wheat
- Polish wheat
- Gluten
- Wheat
- Wheat bran
- Wheat grass (should not contain gluten)
- Wheat Gliadin Tri α Gliadin (Molecular antigen)

Non-Wheat Gluten-Containing Antigens

- Barley
- Malt (Barley)
- Rye
- Spelt
- Oat
 - » While oats are technically classified as a gluten free grain in America, oat avenin can exhibit structural homology with the 33-mer protein in gluten. Oats are also a very common source of gluten contamination.

MOLECULAR ANTIGENS FOR GLUTEN AND DAIRY

IgG Food Explorer includes specific molecular antigens for gluten and dairy, providing increased sensitivity of results beyond extract antigens. Wheat gliadin Tri α Gliadin is indicative of an immune response to gluten. The test measures three dairy molecular antigens to differentiate between responses to whey and casein. These include Cow's milk Bos d 4 (alpha-lactoalbumin) and Cow's milk Bos d 5 (beta-lactoalbumin), which indicates an immune response to whey,

and Cow's milk Bos d 8, which indicates an immune response to casein.

Note: IgG Food Explorer does not test for dietary intolerances (such as lactose intolerance) and does not test for celiac disease-specific antibodies.

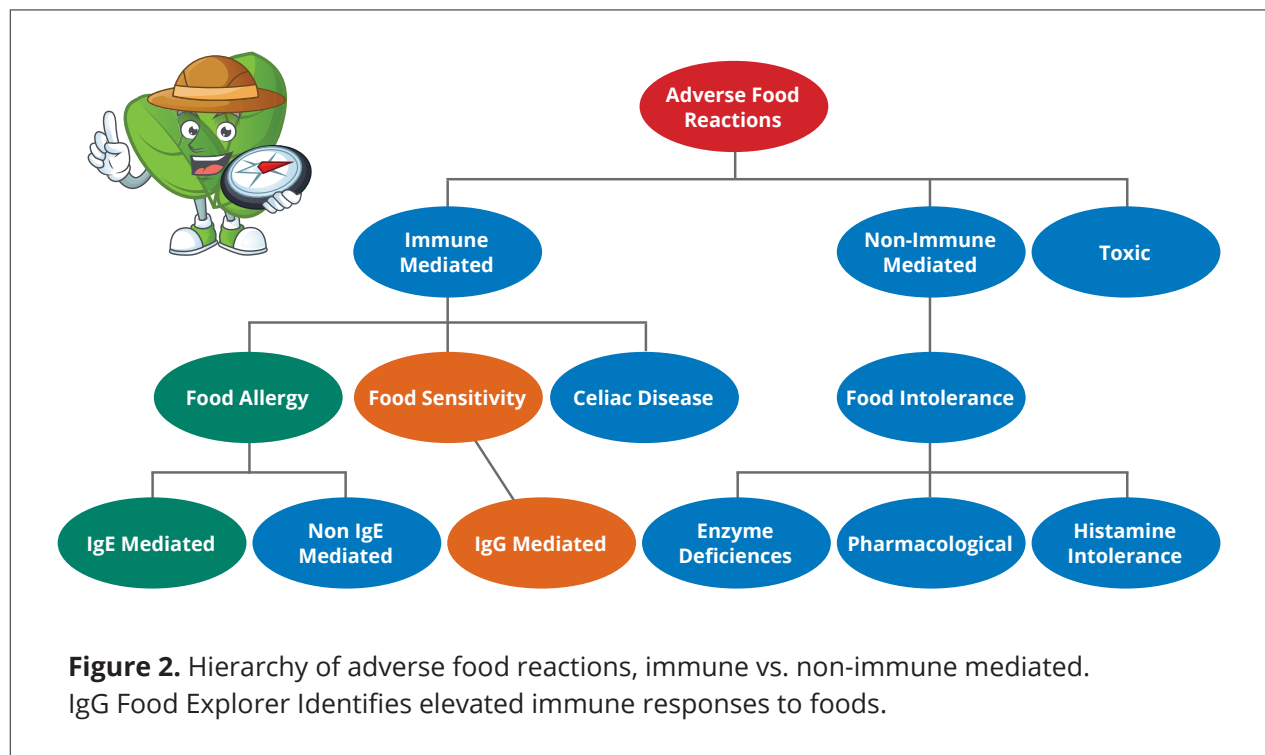
- **Wheat Molecular Antigen**
 - » Wheat Gliadin Tri α Gliadin
- **Dairy Molecular Antigens**
 - » Cow's milk Bos d 4 (α-lactoalbumin) (Whey)
 - » Cow's milk Bos d 5 (β-lactoalbumin) (Whey)
 - » Cow's milk Bos d 8 (Casein)



WHY TEST FOR ADVERSE FOOD REACTIONS?

Over the last two decades, up to 20% of the population in industrialized nations reported an abnormal physical response to food ingestion, also known as an adverse reaction to food (ARF).

About 60% of patients with functional gastrointestinal disorders (FGIDs) report food reaction symptoms. It is often challenging to differentiate food allergy from other adverse food reactions because their symptom presentation may be indistinguishable. IgG Food Explorer provides important insights into IgG-associated reactions a patient may have to a variety of food antigens.



IgG IMMUNE RESPONSE

IgG is the most abundant immunoglobulin in serum. IgG Food Explorer measures total IgG, which includes 4 subtypes: IgG, IgG2, IgG3, and IgG4. The half-life of IgG in serum is approximately 30 days, but this is highly individualized. Elevated IgG antibodies can promote systemic (whole-body) inflammation, which may lead to a variety of symptoms.

SYMPTOMS ASSOCIATED WITH IgG-MEDIATED IMMUNE RESPONSE

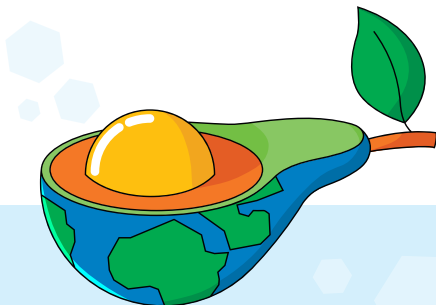
Symptoms may be gut-related symptoms or extraintestinal. They may include, but are not limited to the following:

Gut-Related Symptoms

- Bloating
- Diarrhea
- Nausea
- Constipation
- Reflux
- Irritable bowel syndrome (IBS)

Extraintestinal Symptoms

- Autoimmune conditions
- Skin symptoms including:
 - » Eczema, atopic dermatitis, rashes and urticaria, and bags under eyes
- Headaches/migraines
- Blood sugar imbalances
- Musculoskeletal/joint pain
- Food cravings
- Behavioral symptoms including:
 - » Anxiety, attention deficit hyperactivity disorder (ADHD), mood swings, and autism spectrum disorder (ASD)



CLINICAL CONSIDERATIONS AND THERAPEUTIC APPROACHES

Designing an Elimination Diet

Practitioners can use the results from IgG Food Explorer to design highly individualized elimination diets.

- 1. Evaluate results against current dietary intake.** If a patient is highly reactive to a food they eat daily or frequently, it is likely a cumulative immune response with possible digestive dysfunction or gut hyperpermeability. If they are highly reactive to a food they eat infrequently, it may indicate a more significant response.
- 2. Consider the timeline of antibody response.** The half-life of IgG in serum is approximately 30 days. Patients may need to eliminate foods for about two months before antibodies decline. Consider conducting an elimination diet for approximately 90 days or three months before reintroducing reactive foods.
- 3. Focus on high-positives.** Consider removing foods reported in red for the full duration of the elimination diet. Note the quantification of antibodies to understand the level of immune response within this category. So in this example, eggs would be higher priority for elimination than coconut even though both are in the red category.

Egg white	42.45 µg/ml	● ● ●
Egg yolk	41.35 µg/ml	● ● ●
Coconut	20.18 µg/ml	● ● ●

Figure 3. Positive test results.

- 4. Consume less reactive foods “rotationally.”** Since there is a cumulative effect on the immune system from repeated exposure to foods, a rotational strategy for moderately reactive foods may be helpful. Consider rotating foods that are reported in yellow to decrease cumulative exposure (consume these foods every 3 to 4 days). Patients may find it helpful to avoid combining foods in the same meal that are moderate- or high-positives (yellow or red).
- 5. Systematic reintroduction.** Patients may choose to reintroduce foods from the red category after completing an elimination diet. Reintroduce one food at a time and consume for several consecutive days, taking note of any symptoms. If no symptoms are noted, implement the food rotationally in the diet moving forward. If symptoms are noted, remove the food from the diet for an extended period of time. Reevaluate the impact of digestive dysfunction or gut hyperpermeability on food sensitivities.



DIGESTIVE SUPPORT, GUT HEALING AND ADDITIONAL WORK UP

In addition to implementing an individualized elimination diet, additional digestive support may be needed. IgG-mediated immune responses are often a consequence of poor gut health, poor digestion, dysbiosis, and inflammation — all of which can result in intestinal permeability and loss of oral tolerance to foods.

IgG Food Explorer not only helps pinpoint trigger foods that may be exacerbating a patient's symptoms, but can provide essential clues about gut dysfunction, digestive insufficiency, and intestinal permeability. If a patient has a highly reactive food sensitivity test, GI-MAP® follow-up testing is warranted. Treatments aimed at improving digestion, supporting intestinal barrier integrity, and restoring microbial balance may enhance clinical outcomes.

Improve Digestion, Particularly Protein Digestion

- Digestion begins in the mouth. Chew food thoroughly.
- Support stomach acid production/pH:
 - » Digestive enzymes, digestive bitters, mindful eating, support SCFA-producing bacteria, HCL supplementation where appropriate.
- Support bile composition and flow:
 - » Ox bile, pectin, activated charcoal, soy lecithin, TUDCA, bile acid sequestrants.
- Consider other factors:
 - » Thyroid function, sleep, stress levels, vagal nerve tone, migrating motor complex (MMC), etc.

Repair Gut Hyperpermeability

- Eliminate gluten and reduce exposure to environmental toxicants.
- Consider physiological stress including excess exercise.
- Avoid alcohol use.
- Avoid processed foods and sugars.
- Promote a healthy intestinal barrier with tools such as:
 - » L-glutamine, immunoglobulins, butyrate, essential fatty acids, aloe vera, zinc carnosine, slippery elm, marshmallow root, deglycyrrhizinated licorice, and/or probiotics.

Restore Microbiome Balance

- Evaluate findings on the GI-MAP®.
- Treatment Approaches & Considerations
 - » Support butyrate-producers such as *Faecalibacterium prausnitzii*, *Roseburia* spp., and *Firmicutes*.
 - Increase dietary intake of diverse fibers.
 - Prebiotic supplementation (inulin, FOS, XOS, GOS).
 - » Balance opportunistic/overgrowth microbes
 - *Pseudomonas* spp. and *Staphylococcus aureus* are residents of the stomach and small intestine and are linked to irritable bowel syndrome (IBS) symptoms. *Pseudomonas* spp. is inflammatory and can disrupt the lining of the small intestine, making patients more sensitive to foods. *Staphylococcus aureus* may enhance reactivity to foods.
 - Small intestinal dysbiosis/overgrowth
 - Evaluate levels of *Bacillus* spp., *Enterococcus faecalis*, *Enterococcus faecium*, *Morganella* spp. *Streptococcus* spp. on GI-MAP®.
 - See the GI-MAP Interpretive Guide for therapeutic options and considerations for abnormally high levels of opportunistic bacteria.





FREQUENTLY ASKED QUESTIONS



What is the difference between food allergies and food sensitivities?

There are important differences between food sensitivities and food allergies. Different arms of the immune system facilitate these conditions. Food allergies are immediate, potentially life-threatening, mast-cell mediated, and often involve IgE antibodies. Food sensitivities are delayed reactions and elicit IgG antibodies.

It is best practice to measure IgG and IgE antibodies together as they independently create inflammation and play a role in food-driven symptoms. A food can elicit an IgE response, an IgG response, or both. IgG Food Explorer tests for IgG antibodies only. Consider the companion test, IgE Allergy Explorer™ to measure IgE antibodies and allergy sensitization.



The patient's results show Cow's milk in the green category but Cow's milk Bos d 4 (Alpha-lactoalbumin) and/or Cow's milk Bos d 5 (Beta-lactoalbumin) in the red category. What does this mean?

Cow's milk on the IgG Food Explorer is an extract antigen whereas the Cow's milk Bos d 4 (Alpha-lactoalbumin) and Cow's milk Bos d 5 (Beta-lactoalbumin) are molecular antigens specific for whey proteins. Molecular antigens offer enhanced sensitivity compared to the extract antigen. A positive result of one or both of these molecular antigens indicates an immune response specifically to the whey component in dairy. In the case of low IgG level of extract antigen and a high IgG level of molecular antigen, the removal of dairy products containing whey is indicated.

This pattern is common if patients are consuming high levels of supplemental whey protein from protein powders, protein bars, etc. Whey is also a common additive ingredient in many processed foods.





What is Elevated CCD/Cross-Reactivity?

CCD stands for Cross-reactive Carbohydrate Determinate. The CCD/Human Lactoferrin analyte is not directly clinically relevant. It can be used to identify samples with a potentially high level of cross-reactivity with other analytes. Therefore, if CCD is elevated and there are a high number of positive analytes on the chip, cross-reactivity leading towards increased signal and false positive reactivities is very likely.

In this case, it is recommended to focus on high-positives (foods in the red category) and the direct quantification of antibodies within that category (numerical value reported).



What is Microbial Transglutaminase?

M-Transglutaminase, meat glue

28.42 µg/ml



Figure 3. Antibody level for microbial transglutaminase .

Antibodies to microbial transglutaminase are also tested on IgG Food Explorer. Microbial transglutaminase is a food additive colloquially known as “meat glue.” As the nick name suggests, it is used throughout the food industry to “glue” proteins together and improve texture and appearance of processed foods. It is often used to create one piece of meat from several pieces or types (ex. chicken sausages).

Microbial transglutaminase is functionally similar to the human transglutaminase enzyme which can bind and cross link gliadin peptides in the pathogenesis of celiac disease. Recent publications found microbial transglutaminase (MTg) to be immunogenic in celiac disease patients creating a new theory in the environmental attributes to the rise in celiac disease.

Microbial transglutaminase is on the GRAS list per FDA, but the additive has been banned in Europe since 2010.

According to the USDA, there is mandatory labeling requirements for this product. The enzyme must be listed in the product ingredient statement. Products formed from pieces of whole muscle meat, or that have been reformed from a single cut, must disclose the fact on their label, or as part of the product name (ex. Formed beef tenderloin).





A patient knows they are reactive to a particular food, but the test shows no reaction. Why is that?

The IgG antibody testing is exposure-based, so it is important to first evaluate if or how frequently the patient is eating a particular food. If they never or seldom consume that food, this could explain why the test is non-reactive. Alternatively, they may be experiencing a non-immune-mediated reaction to that food (example: lactose intolerance).



Can I use the test for pediatric populations?

Antibody testing under the age of two years old can result in false negatives as the immune system may not be mature enough to mount a similar response to an adult immune response. The test was validated in an adult population.



Can a patient use a product with allicin as an ingredient if they react to garlic?

IgG Food Explorer measures an immune reaction to food proteins. If an allicin product has had most or all of the proteins removed (i.e. is in extract form), a patient may be able to tolerate it.



Can a patient use a colostrum supplement if they react to dairy?

Patients should exercise caution if they have an IgG-mediated response to dairy. They should avoid colostrum if they have an IgE-mediated response.



If a patient's results show a sensitivity to almonds, can they have almond milk?

The IgG Food Explorer is an antigen extract test. Almond is a raw extract whereas almond milk has been heated and processed through the milk production process. Antibodies bind to proteins in food sources. These proteins can denature/change through the heating and production process of almond milk, thus almond milk can have different protein conformation compared to almonds. This is why there can be reactivity to one but not the other. It is recommended to consider the quantitative result to understand the level of immune reaction. If a patient is highly reactive to almonds, it may be prudent to consume an alternative milk product besides almond milk.

This same FAQ applies to coconut vs. coconut milk.





FOOD EXPLORER

SUPPORT INFO

877-485-5336

METHODOLOGY

Elisa-based multiplex food sensitivity test measuring total IgG antibodies.

SPECIMEN REQUIREMENTS

Whole Blood – 250 µl minimum.

TEST ORDERING OPTIONS

- IgG Food Explorer™

Optional Ordering Options

- IgE Allergy Explorer™
- IgG/IgE Combined Explorer
- GI-MAP® - GI Microbial Assay Plus
- OMX® - Urine & Plasma
- OAp™ - Organic Acids Profile

Visit our website for details on any of our test offerings.

Build Your Knowledge With Our Complimentary Educational Services at DSL Academy:

DSL Academy (DSL A) is an exclusive, online learning platform designed to help you better interpret DSL test offerings. The DSL A curriculum is taught by the DSL Medical Education Team and is available to all active DSL account holders. *Learn more at: www.diagnosticsolutionslab.com/clinicians/dsl-academy.*

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