IgE™
ALLERGY EXPLORER

Diagnostic Solutions laboratory
Phone: 877-485-5336
Email: cs@diagnosticsolutionslab.com
Web: diagnosticsolutionslab.com

Alpha-Gal Syndrome (AGS)

Interpretive Guide for Ordering Clinicians

INTERPRETIVE GUIDE

IgE Allergy Explorer™ - Alpha-Gal Syndrome

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

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WHAT IS ALPHA-GAL SYNDROME?

Alpha-gal syndrome (AGS) is a tick bite–induced IgE-mediated food allergy to the carbohydrate molecule galactose-α-1,3-galactose (alpha-gal). This sugar is present on the cells of most mammals, meaning it is found in the meat, organs, and byproducts of beef, pork, lamb, venison, and related animals.

Unlike classic protein-based food allergies, alpha-gal is a carbohydrate allergen. Because alpha-gal is incorporated into lipids that are slowly metabolized in the gut, allergic reactions typically appear 2–6 hours after eating — *not immediately*. This delayed onset is one of the hallmark features that distinguishes AGS from other IgE-mediated allergies and frequently leads to delayed or missed diagnoses.

How It Develops

AGS develops following the bite of the lone star tick (*Amblyomma americanum*), the primary vector in the United States. The tick's saliva contains alpha-gal; when injected into human skin, it triggers a Th2-type immune response that drives IgE antibody production against alpha-gal.

Repeated tick bites can boost IgE levels and worsen reactivity. Conversely, strict tick avoidance over time is associated with a gradual decline in IgE levels in some patients. The lone star tick is endemic across the South, Midwest, and Eastern United States, though the range is expanding.

Symptoms

AGS produces classic IgE-mediated allergic symptoms, which may include:

- Skin and mucous membranes: hives (urticaria), angioedema, flushing
- **Gastrointestinal:** Abdominal pain, nausea, vomiting, diarrhea — reactions can mimic irritable bowel syndrome (IBS) and have been mistaken for functional GI disorders
- Respiratory: Shortness of breath, wheezing, throat tightening
- Cardiovascular: Hypotension, tachycardia
- Anaphylaxis: Severe, life-threatening reactions requiring epinephrine have been reported in a significant proportion of affected patients.

AGS is increasingly recognized as a cause of unexplained gastrointestinal symptoms. In some patients, abdominal pain and diarrhea occurring hours after meals may be the sole or dominant clinical presentation — closely mimicking IBS or functional bowel disease. Consider a GI-MAP® comprehensive stool test as part of the workup for unexplained GI symptoms.

USING IgE ALLERGY EXPLORER FOR ALPHA-GAL SENSITIZATION

What the Test Measures

This panel detects serum IgE antibodies directed against the alpha-gal carbohydrate epitope (galactose-α-1,3-galactose) as well as specific mammalian meat antigens including beef, pork, and lamb. Elevated IgE indicates immunological sensitization — the immune system has produced antibodies against alpha-gal and/or related meat proteins.

Understanding the Result

A serum alpha-gal IgE level ≥ 0.1 kU/L is the widely used threshold for a positive result, consistent with CDC surveillance criteria for suspected AGS. IgE Allergy Explorer quantifies alpha-gal antibodies with the following scale. Results should always be interpreted in conjunction with the patient's clinical history, symptoms, and exposure history.

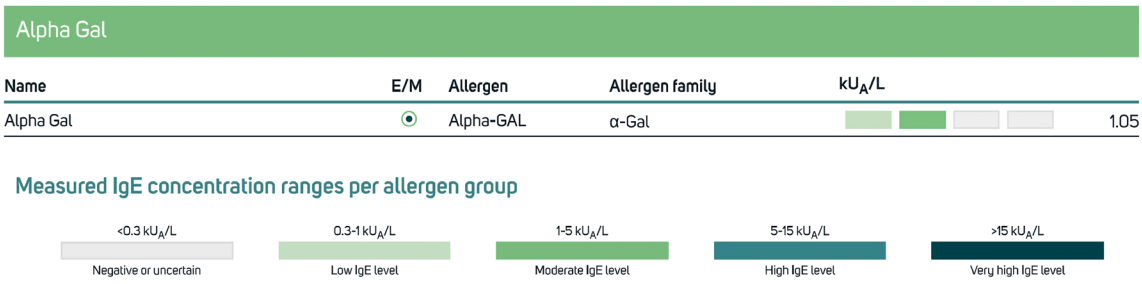

Figure 1. Alpha-Gal Sample Report.

Why the Mammalian Meat Panel Adds Value

Individual IgE results for beef, pork, and lamb are included in this profile because:

- A positive alpha-gal IgE with positive individual meat antigens supports clinical correlation of allergy sensitization.
- A negative result for a specific meat (e.g., lamb) does NOT indicate that meat is safe. If alpha-gal IgE is positive, all mammalian meats carry risk, regardless of individual antigen results.
- Comparing IgE levels across antigens can inform patient counseling about relative exposure risk but cannot define a safe threshold for any individual patient.

IMPORTANT: SENSITIZATION ≠ ALLERGY DIAGNOSIS

A positive alpha-gal IgE result indicates immunological sensitization — it does not, by itself, establish a clinical diagnosis of alpha-gal syndrome.

Studies show that up to 33% of tested individuals in high-endemic areas may be IgE-positive without any clinical symptoms. Sensitization is a necessary, but not sufficient, condition for AGS diagnosis. Incorrectly diagnosing AGS based on positive IgE alone, without correlating symptoms and history can result in unnecessary dietary elimination and lifestyle burden.

What Is Sensitization?

Sensitization means the immune system has been exposed to alpha-gal and produced specific IgE antibodies in response. These antibodies can be detected in the blood. However, the presence of antibodies does not predict whether, when, or how severely a person will react.

What Is Needed for an AGS Diagnosis?

A clinical diagnosis of alpha-gal syndrome requires all three of the following:

1. **Clinical symptoms:** Documented allergic or GI symptoms consistent with an IgE-mediated reaction (hives, angioedema, GI distress, anaphylaxis, etc.)
2. **Positive alpha-gal IgE:** Serum IgE ≥ 0.1 kU/L on validated laboratory testing
3. **Delayed clinical response:** Symptoms occurring 2–6 hours after consumption of mammalian meat or mammalian-derived products, ideally with response to elimination of those foods

⚠ Important Reminder

There is no single "safe" IgE level below which all patients are guaranteed to be symptom-free. Reaction severity is not linearly proportional to antibody level. A patient with a low positive IgE may react severely under certain conditions (cofactors, high-fat meat, exercise), and a patient with a high IgE may be clinically quiescent. All results must be interpreted in full clinical context. Monitoring IgE levels over time in a diagnosed patient is best clinical practice along with tick bit avoidance.

ACTION STEPS WITH POSITIVE RESULTS

Positive IgE results should prompt a thorough clinical evaluation and, where appropriate, the following evidence-based management steps. Referral to an allergist is strongly recommended for symptomatic patients.

1 – Dietary Avoidance

The primary management strategy is eliminating alpha-gal–containing foods. This includes:

Meats to Avoid

- Beef, pork, lamb, bison, buffalo, venison, rabbit, squirrel, goat
- Organ meats: liver, kidney, heart, tripe
- Processed meats using mammalian-derived ingredients (sausage casings, lard, tallow, gelatin, bouillon, gravies, stocks)

Hidden Sources of Alpha-Gal in Foods and Supplements

- Gelatin-containing foods and candies (gummy bears, jelly candies), marshmallows, puddings
- Refried beans (may contain lard), biscuit mixes, pie crust, corn muffin mix
- Canned soups and gravies (often contain meat-based stock)
- Butter, heavy cream, soft cheeses, yogurt (dairy varies; see below)
- Carrageenan — a red algae–derived food additive that carries the alpha-gal epitope; found in many processed foods
- High-fat foods of any kind cooked in shared oil, pans, or grills used for mammalian meats

Note on dairy: *Approximately 80–90% of AGS patients tolerate low-fat dairy. A patient's tolerance of dairy can serve as a useful proxy for whether they will react to lower-level hidden exposures. Patients who tolerate dairy should generally keep it in their diet unless they develop clear reactions.*

2 – Safe Protein Alternatives

An alpha-gal–safe diet does not mean a low-protein diet. The following are safe and nutritious alternatives:

- Poultry: chicken, turkey, duck (birds do not express alpha-gal)
- Seafood: all fish and shellfish
- Eggs
- Legumes: beans, peas, lentils, chickpeas
- Nuts and seeds
- Whole grains
- Fruits and vegetables

Plant-based, dairy-free, and certified vegan recipes are excellent resources for meal planning, as they are designed to exclude mammalian animal products.

3 – Non-Food Exposures to Address

Medications, Supplements & Clinical Products

- Gelatin-coated capsules or “soft gels” (very common in OTC and prescription medications)
- Lactose-containing medications
- Medications derived from mammalian cell lines
- Vaccines containing gelatin stabilizers: MMR, varicella, some formulations of yellow fever and rabies vaccines

Patients should have AGS documented as both a food AND drug allergy in their medical record, specifying the allergen as “alpha-gal” or “galactose-alpha-1,3-galactose.” This ensures providers are alerted during prescribing and procedural planning.

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Personal Care Products

The following personal care categories may contain lanolin, collagen, casein, tallow, or other mammalian-derived ingredients and should be reviewed for AGS-safe formulations:

- Soaps, lotions, moisturizers, and skincare serums
- Shampoos, conditioners, and styling products
- Chapstick and lip products
- Makeup and foundations
- Deodorant / antiperspirant
- Sunscreen

4 – Tick Bite Prevention

Ongoing tick exposure can maintain or boost IgE levels, and additional bites can reactivate or worsen allergy even in patients whose IgE was declining. Therefore, tick bite prevention is a critical, non-negotiable component of AGS management.

- Wear light-colored long sleeves and pants when outdoors in wooded or grassy areas
- Apply EPA-registered repellents (DEET, picaridin, IR3535, or permethrin-treated clothing)
- Perform thorough tick checks after any outdoor activity
- Remove attached ticks promptly with fine-tipped tweezers
- Manage landscaping and monitor pets for ticks

ADDITIONAL RESOURCES

For Clinicians

- CDC: About Alpha-gal Syndrome
- CDC: Understanding and Managing Alpha-Gal Syndrome for Healthcare Providers (Training Module)
- Thompson JM et al., MMWR 2023 — Geographic Distribution of Suspected AGS Cases in the U.S.
- Commins SP — Diagnosis & Management of Alpha-Gal Syndrome: Lessons from 2,500 Patients (Expert Rev Clin Immunol, 2020)

For Patients & Families

- Alpha-Gal Action (Patient Advocacy & Community Resources)
- CDC: Alpha-Gal Syndrome — Patient Information
- FIG App — Identifies Hidden Animal-Derived Ingredients in Packaged Foods

Tick Prevention Resources

- CDC: Tick Prevention — How to Avoid Tick Bites
- CDC: Tick Identification and Reporting

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LEARN MORE

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IgE Allergy Explorer™ and *IgG Food Explorer™* are available to order separately *or together* in one convenient collection kit.‡

‡ *Immune response profiles from Diagnostic Solutions Laboratory are not intended for disease diagnosis. Information provided by Diagnostic Solutions Laboratory does not constitute medical advice; but is for educational purposes only. Services provided are for laboratory testing only.*

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