

The terms food allergies, sensitivities, and intolerances are often confused and used interchangeably, although they are unique physiological conditions. A true food allergy causes an immune system reaction that affects numerous organs in the body. It can cause a range of symptoms, and, in some cases, an allergic food reaction can be severe or life-threatening. In contrast, symptoms of food intolerances or sensitivities are generally less serious, but often more difficult to detect or diagnose.

## Food Allergy:

These are called type 1 hypersensitivities, whereby the immune system identifies some components of food proteins as dangerous and produces IgE antibodies against that food. True food allergies are mediated by mast cell activation that subsequently releases large amounts of histamine into the system. True allergy symptoms are acute onset (usually within 1 hour) and can range in severity from mild to severe.

## Food Sensitivity:

These are called non-IgE reactions, or type 2, 3, and 4 hypersensitivities. In food sensitivities, food protein antigens will bind to antibodies and form an immune complex, which can evoke systemic immune responses. Symptoms of food sensitivities are often delayed and hard to pinpoint or detect.

## Food Intolerance:

These are reactions that do not involve the immune system. Usually food intolerances are caused by a deficiency in a protein or enzyme critical to proper digestion of a food. Lactose intolerance is a classic example in which certain people lack the enzyme lactase and cannot break down this carbohydrate.

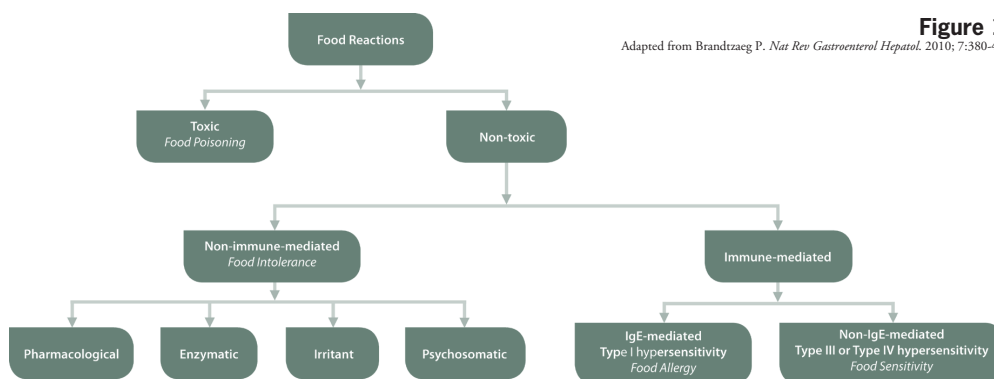


Figure 1

Adapted from Brandtzaeg P. *Nat Rev Gastroenterol Hepatol.* 2010; 7:380-40

## What is the distinction between IgG vs. IgA antibodies?

- A primary piece to understanding antibodies is their area of origin. IgA antibodies are produced by saliva, tears, and mucosal linings in the lungs and the intestines. IgG antibodies are the most abundant in serum and are produced by almost every cell in the body. IgG antibodies can cross the placenta.
- These antibodies also have considerably different half-lives. IgA antibodies have a half-life of ~6 days. Elevated IgA antibodies indicated exposure 8-12 days ago. The half-life of IgG is much longer and individually variable and can indicate prolonged exposure/sensitivity.
- In terms of food sensitivities and intestinal autoimmune disease, IgG antibodies can occur as a consequence of and can be downstream to intestinal permeability. These are likely correlated with more systemic immune responses (brain fog, fatigue, skin problems, migraines, etc). Vibrant Wellness does not measure IgG subclasses.
- The relationship between food sensitivities and IgA antibodies is less well understood. IgA is largely produced by lymph tissue of the lamina propria (GALT-gut associated lymphoid tissues). When the mucosal barrier of the intestinal cells breaks down (becomes leaky), IgA can complex with protein antigens and transport them, via an IgA specific receptor protein, across the epithelial cells and into the luminal secretions. IgA antibodies can also be detected in the blood, which may indicate some degree of intestinal and/or mucosal damage and loss of oral tolerance.
- It is important to look at both IgA and IgG antibodies to food antigens. A food may trigger an immune response through an IgG derived mechanism, while having absolutely no effect on IgA, or vice versa.
- Vibrant Wellness Food Sensitivity classifies the results as negative (0-10, moderate (11-20), or positive (21-30). Most foods, will elicit some degree of an antibody response, which the immune system can typically handle. It is when antibodies accumulate and persist in circulation (i.e. moderate to positive levels), that oral tolerance is lost and symptoms ensue.
- As with all immunoglobulin testing, it is important to evaluate the person's baseline levels of (total) IgA and IgG. These biomarkers are included in the Vibrant Wheat Zoomer.
- Research suggests that low levels of immunoglobulin A, leading to low levels of secretory IgA (SIgA) can be a risk factor for developing true food allergies (IgE reactions to foods).
- IgA and SIgA are not entirely the same. The main reason for the confusion is that the terms SIgA and IgA are often used interchangeably in the literature, although technically they should not be. There is a direct connection in that SIgA is produced from IgA, but low/high levels of serum IgA cannot necessarily accurately predict or determine SIgA levels.

## What is oral tolerance?

Food sensitivities are often referred to as a "loss of oral tolerance." Oral tolerance refers to the immune system's normal ability to maintain homeostasis in the presence of foreign food proteins.

## Antibodies

Vibrant Wellness Food Sensitivity test measures both IgA and IgG antibodies to 96 different food antigens (proteins). Antigens are sourced from FDA-approved raw, organic foods. Vibrant Wellness reports IgA and IgG antibodies independently on our Food Sensitivity test. Most other labs report these different antibodies as combined values.

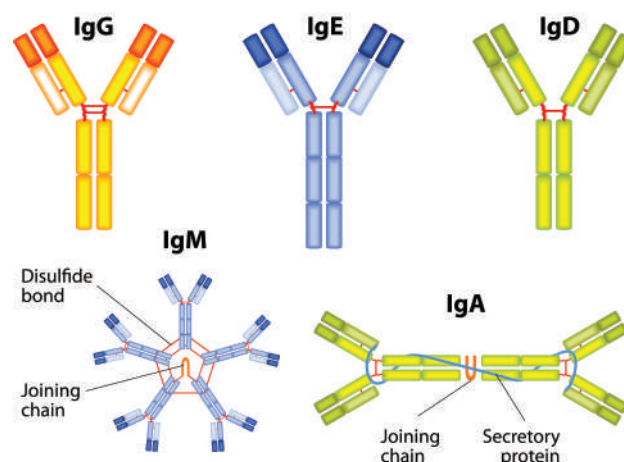
## Regulatory Statement:

This information is provided for educational purposes only. Vibrant Wellness does not diagnose, treat or prescribe for any health condition. This test has been laboratory developed and its performance characteristics determined by Vibrant America, a CLIA-certified laboratory performing the test. The test has not been cleared or approved by the U.S. Food and Drug Administration (FDA). Although FDA does not currently clear or approve laboratory-developed tests in the U.S., certification of the laboratory is required under CLIA to ensure the quality and validity of the tests.

## Food Sensitivity Action Steps:

- 1) Evaluate total immunoglobulins.
- 2) Check intestinal permeability and dysbiosis; antibody reactivity to food proteins is almost always an indication of some level of intestinal permeability as a result of mucosal inflammation and low microbial diversity.
- 3) Food Sensitivity testing can be very useful to help prioritize an elimination or rotational diet. Usually removing foods that the body has produced antibodies to will alleviate symptoms, because the source of inflammation is removed. The ideal time course for elimination is not established. Consider magnitude of antibody response, ½ life of antibodies, patient's current dietary intake, level of motivation, status of mucosal integrity, and remission and/or progression of symptoms.

## ANTIBODY CLASSIFICATION



	IgE	IgG	IgA
<b>Area of Origin</b>	Mast cells	Most body cells	Mucosal tissue (saliva, tears, intestinal mucus, bronchial secretions); 70% of IgA is derived from the gastrointestinal tract.
<b>Antibody Half life</b>	1-3 days	Highly variable 23-96 days	6-8 days
<b>Percentage in Serum</b>	Only 1-2% of immunoglobulins in the blood are IgE	Most abundant immunoglobulin in circulation: ~80% of immunoglobulins in the blood are IgG	~15% of immunoglobulins in circulation are IgA
<b>Mechanism of Action</b>	Mast cell-mediated-releases histamines	Complement system	Phagocytic cells (monocytes and neutrophils)
<b>Clinical Utility for testing against food antigens</b>	Immediate reaction True allergy Type I hypersensitivity	Delayed reaction Type III hypersensitivity	Delayed reaction Mucosal damage
<b>Mechanism of Action</b>	Acute reactions typically affecting airways, skin, or intestines: hives, anaphylaxis, rashes, swelling, etc.	Highly variable systemic responses: IgG antibodies can deposit in any tissue and cause inflammation	Signs of mucosal irritation, such as gastrointestinal distress (gas, bloating, stomach distention)

1. <http://www.nature.com/mi/journal/v4/n6/full/mi201141a.html?foxtrotcallback=true>
2. Mullin G. et al. Testing for food reactions: the good, the bad, and the ugly. *Nut Clin Prac* 2010; 25:2; 192-98.
3. Gonzalez-Quintela, A., R. Alende, F. Gude, J. Campos, J. Rey, L. M. Meijide, C. Fernandez-Merino, and C. Vidal. "Serum Levels of Immunoglobulins (IgG, IgA, IgM) in a General Adult Population and Their Relationship with Alcohol Consumption, Smoking and Common Metabolic Abnormalities." *Clinical & Experimental Immunology* 151.1 (2007): 42-50. Web
4. Van der Steen L, Bakema J, van Egmond M, et al. Blocking Fcα receptor I on granulocytes prevents tissue damage induced by IgA autoantibodies. *Journal Of Immunology* (Baltimore, Md.: 1950) [serial online]. August 15, 2012;189(4):1594-1601. Available from: MEDLINE with Full Text, Ipswich, MA. Accessed June 28, 2017.
5. Mkaddem, S. B., Christou, I., Rossato, E., Berthelot, L., Lehuen, A., & Monteiro, R. C. (2014). IgA, IgA receptors, and their anti-inflammatory properties. *Current Topics In Microbiology And Immunology*, 382221-235. doi:10.1007/978-3-319-07911-0\_10

## References:

