

RMA FST Enhanced **Accession: 123456**

Healthcare Professional

Patient

Age:
Date of Birth:
Gender: Female



RESULT STATUS NOTE: Results are reported in U/mL. The limits assigned to individual antigens are based on a statistical analysis of a Canadian population

NORMAL The upper limit for assigning **Normal** status varies by antigen.

BORDERLINE The upper and lower limits for assigning **Borderline** status vary by antigen.

ELEVATED The lower limit for assigning **Elevated** status varies by antigen.

Dairy / Egg

2 Alpha-Lactalbumin (whey)	4 Beta-Lactoglobulin (whey)	102 Casein
76 Egg White	12 Egg Yolk	8 Milk (Buffalo)
126 Milk (Cow)	68 Milk (Goat)	79 Milk (Sheep)

Grains

79 Barley	22 Couscous	29 Durum Wheat
63 Gliadin	40 Malt	55 Oat
17 Rye	43 Spelt	48 Wheat
29 Wheat Bran		

Grains (Gluten-Free)

9 Amaranth	39 Buckwheat	46 Corn
0 Millet	3 Polenta	3 Quinoa
21 Rice	0 Tapioca	

Fruit

6 Apple	21 Apricot	21 Avocado
7 Banana	16 Black Currant	5 Blackberry
0 Blueberry	13 Cherry	17 Cranberry
3 Date	33 Fig	10 Grape (Black/Red/White)
7 Grapefruit	15 Guava	2 Kiwi
8 Lemon	17 Lime	8 Lychee
13 Mango	5 Melon (Galia/Honeydew)	3 Mulberry
15 Nectarine	7 Olive	57 Orange
21 Papaya	4 Peach	6 Pear
18 Pineapple	51 Plum	17 Pomegranate

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Fruit

14	Raisin	18	Raspberry	12	Red Currant
10	Rhubarb	7	Strawberry	18	Tangerine
8	Watermelon				

Vegetables

12	Artichoke	6	Arugula	3	Asparagus
4	Beet	4	Bell Peppers	6	Broccoli
10	Brussels Sprout	6	Cabbage (Red)	25	Cabbage (Savoy/White)
5	Carrot	6	Cauliflower	19	Celery
13	Chard	5	Chicory	9	Cucumber
6	Eggplant	3	Fennel (Leaf)	11	Leek
4	Lettuce	2	Onion	24	Potato
37	Radish	10	Shallot	4	Spinach
18	Squash (Butternut/Carnival)	4	Squash, Summer	7	Sweet Potato
8	Tomato	10	Turnip	3	Watercress
17	Yuca				

Fish / Seafood

46	Alga Espaguette	18	Alga Wakame	4	Anchovy
7	Barnacle	9	Bass	17	Carp
8	Caviar	22	Clam	4	Cockle
6	Cod	2	Crab	5	Cuttlefish
2	Eel	3	Haddock	0	Hake
9	Herring	2	Lobster	21	Mackerel
4	Monkfish	24	Mussel	3	Octopus
11	Oyster	2	Perch	6	Pike
15	Plaice	2	Razor Clam	11	Salmon
1	Sardine	7	Scallop	4	Sea Bream (Gilthead)
7	Sea Bream (Red)	15	Shrimp/Prawn	14	Snail (Sea Snail/Winkle)
7	Sole	6	Spirulina	2	Squid
4	Swordfish	18	Trout	0	Tuna
2	Turbot				

Meat

3	Beef	12	Chicken	7	Duck
2	Goat	18	Horse	1	Lamb
5	Ostrich	2	Ox	3	Partridge
4	Pork	6	Quail	14	Rabbit
6	Turkey	7	Veal	10	Venison
6	Wild Boar				

Herbs / Spices

3	Aniseed	11	Basil	8	Bayleaf
5	Camomile	5	Cayenne	33	Cinnamon
1	Clove	3	Coriander (Leaf)	4	Cumin
43	Curry (Mixed Spices)	6	Dill	2	Garlic
10	Ginger	67	Ginkgo	6	Ginseng
17	Hops	11	Licorice	2	Marjoram

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Herbs / Spices

16	Mint	30	Mustard Seed	1	Nettle
14	Nutmeg	3	Parsley	13	Peppercorn (Black/White)
11	Peppermint	4	Red Chili Pepper	15	Rosemary
2	Saffron	14	Sage	11	Tarragon
10	Thyme	3	Vanilla		

Nuts / Seeds / Legumes

55	Almond	16	Bean (Broad)	7	Bean (Green)
46	Bean (Red Kidney)	43	Bean (White Haricot)	24	Brazil Nut
2	Canola	24	Cashew Nut	12	Chestnut
7	Chickpea	3	Coconut	8	Flax Seed
42	Hazelnut	13	Lentil	0	Macadamia Nut
77	Pea	38	Peanut	14	Pine Nut
29	Pistachio	0	Sesame Seed	15	Soy Bean
27	Sunflower Seed	31	Tiger Nut	16	Walnut

Miscellaneous

69	Agar Agar	47	Aloe Vera	17	Cane Sugar
9	Caper	90	Carob	41	Cocoa Bean
15	Coffee	70	Cola Nut	2	Honey
9	Mushroom	8	Tea (Black)	7	Tea (Green)
0	Transglutaminase	23	Yeast (Baker's)	54	Yeast (Brewer's)

Note: Quantification of Food Specific IgG has been utilized in research settings to assess and investigate Type III hypersensitivity. Measurement of food specific IgG is not a diagnostic indicator of IgE (classical or type I) allergy and should not be used for this purpose. Measurement of *Candida albicans* IgG levels is not a diagnostic indicator of Candidiasis. Research studies have shown levels of *Candida albicans* IgG in the circulation to have some Correlation with the degree of its colonization in the gut. Use of repeat serum IgG measurements to monitor declining *Candida albicans* burden is not recommended. The Burnaby Reference Laboratory is ISO 15189 accredited by The Institute of Quality Management in Healthcare for this class of test. The tests are currently not accredited by the Diagnostic Accreditation Program. An accreditation application has been submitted.

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IgG FOOD REACTIONS VS IgE FOOD ALLERGIES: IgG food reactions differ significantly from classic IgE food allergies. IgE food allergies are immediate reactions that occur within minutes or hours of consuming a food and may include serious reactions like hives, difficulty breathing and anaphylaxis. In contrast, an IgG food sensitivity is a delayed reaction that occurs hours to days after the food is consumed, with symptoms that may not appear for days or months. Lack of an IgG antibody response to a specific food does not rule out the possibility that the food may elicit an IgE reaction (food allergy). Patients should continue to avoid foods to which they have a known IgE food allergy. Conversely, elevated IgG to a specific food is not diagnostic of IgE food allergy. If symptoms (e.g. hives, difficult breathing) are suggestive of food allergy, the patient should be referred to an Allergist Specialist for specific IgE testing via ImmunoCAP.

IgG REACTIONS: IgG reactions are food sensitivities, not food allergies. When a reactive food is consumed, the IgG antibody forms a complex with the food antigen. Normally, the body is able to eliminate these antibody-antigen complexes, but with excess antigen, small complexes tend to deposit in blood vessel walls where they can cause tissue injury via the release of inflammatory mediators [Brantzaeg 1997]. Over time, this tissue injury may contribute to the development of a variety of health conditions. Research has shown that elimination of IgG reactive foods from the diet improves a variety of health conditions including irritable bowel syndrome and migraine headaches [Atkinson, Alpay]. Eliminating IgG reactive foods has also been reported to help with eczema, mood disturbances, weight gain and other digestive disturbances [Mullin, Lewis, Bentz].

NORMAL REACTIONS: A normal reaction to a food antigen may indicate lack of recent exposure to that food. Therefore, under circumstances of complete avoidance, it is impossible to determine whether the food(s) avoided would elicit a reaction if consumed recently. It is important to note that a normal reaction to a specific food does not mean it can be safely consumed by someone who has previously had a serious reaction to that specific food. Serious reactions to foods (e.g. anaphylaxis or hives) are caused by IgE antibodies, not IgG. Therefore, a normal IgG reaction to a known food allergen is not an indication the tested food is safe to consume.

PATIENT HAS A REACTION TO ONE OR MORE FOOD ANTIGENS NOT CONSUMED REGULARLY: It is possible to have elevated IgG to foods not recently consumed, or to foods that have been specifically avoided (i.e. due to serious previous IgE reaction). Elevated IgG in this circumstance may be due to panallergen reactions [refer to the RMA FST Food Sensitivities and Cross-Reactions document], or to an abundance of the IgG4 subtype antibody, which acts on mast cells and may have a protective effect for IgE reactions and antibodies may remain in circulation for 18 months even with no exposure [Mullin].

GOAT'S MILK AND/OR SHEEP'S MILK ARE BORDERLINE OR ELEVATED but patient may have never consumed: In vitro studies have shown extensive cross reactivity between milks from ruminant species. Significant amino acid sequence homology between milk from cows, goats and sheep mean cross-reactivity is highly probable [URL: www.uptodate.com/contents/milk-allergy-management. Accessed June 11, 2016]. Clinical research has found that a significant percentage of cow's milk allergic patients also react to goat and sheep milks [Pediatr Allergy Immunol. 2012 Mar;23(2):128-32].

CORN IS BORDERLINE OR ELEVATED AND POLENTA IS NORMAL: Polenta is a cooked dish made from cornmeal. Since the application of heat denatures proteins, it is possible for the cooked form (polenta) to elicit a different immunological response than the uncooked or raw form (corn) of the same food. It is important to note however, that packaged and uncooked polenta grain (i.e. cornmeal) is different from cooked polenta, and should be avoided in its uncooked state. Food sources of corn include: artificial colours and flavours, baking powder, bleached white flour, cake mixes, caramel colour/flavouring, confectioners sugar, corn alcohol, corn chips, corn extract, corn flour, corn oil, corn pone, corn starch, corn syrup, gravy, grits, hominy, maize, modified corn starch, modified food starch, popcorn, tortillas. Corn may also be present in various sugars including: dextrose, fructose, glucose, maltose, sorbitol, saccharin, sucrose, sucralose, and xylitol. Note: corn may be present in small amounts in many products, but not appear on a list of ingredients.

AGAR AGAR IS BORDERLINE OR ELEVATED: Agar agar is used as a thickener, gelling agent, texturizer, moisturizer, emulsifier, flavor enhancer, and absorbent and is an allowed additive in certified organic foods. Hidden and/or minor sources of agar agar may elicit an IgG response, but the limited exposure to antigen means that it is unlikely to result in a clinical effect. Therefore, unless the clinician determines otherwise, reactions to agar agar rarely warrant strict avoidance of trace amounts.

COLA NUT IS BORDERLINE OR ELEVATED: Cola Nut may be found in non-alcoholic and alcoholic beverages, baked goods, puddings, candies and frozen dairy. It is typically referred to generically as a "natural flavouring." These hidden and/or minor sources of cola nut may elicit an IgG response, but the limited exposure to antigen means that it is unlikely to result in a clinical effect. Therefore, unless the clinician determines otherwise, reactions to cola nut rarely warrant strict avoidance of trace amounts.

CURRY IS BORDERLINE OR ELEVATED: Note that curry is a combination of several spices including: cardamom, chili, cloves, cinnamon, coriander, cumin, garlic, ginger, mustard, nutmeg, onion, paprika, pepper, and turmeric. The RMA FST does not test turmeric, paprika or cardamom separately. Therefore, if all the component curry spices tested are in the normal range, but curry is Borderline or Elevated, the clinician may decide avoidance of cardamom, paprika and turmeric is warranted in addition to curry powder.

BREWER'S YEAST IS BORDERLINE OR ELEVATED: Note that Brewer's Yeast and Baker's Yeast are different strains of one organism, *Saccharomyces cerevisiae*. The Brewer's Yeast strain is slower acting and has less after-taste than Baker's Yeast. Food sources of Brewer's Yeast include: beer, cider, dried fruits, marmite, miso, tamari, vegemite, yeast extract, wine. Brewer's Yeast may also be added to cookies, oatmeal and yogurt to improve nutrition. Brewer's Yeast is high in chromium and B vitamins and may be used in supplements.

BREWER'S YEAST IS BORDERLINE or ELEVATED AND BAKER'S YEAST IS NORMAL: Note that Brewer's yeast and Baker's yeast are different strains of the same *Saccharomyces cerevisiae* organism. The Brewer's yeast strain is selected for its ability to tolerate a more anaerobic (oxygen deprived) and high alcohol environment while the Baker's yeast form multiplies quickly and under high heat conditions. Despite the differences between the strains, and the fact that the patient reacted only to BREWER'S YEAST, the clinician may determine that avoidance of both strains is warranted depending on the clinical situation.

SEVERAL BIRCH POLLEN PROFILIN CONTAINING FOODS ARE ELEVATED: Profilins are small proteins in the plant cell cytoplasm that play a significant role in sensitizing individuals to pollens. Profilins are responsible for Oral Allergy Syndrome, a condition that results in burning or tingling in the mouth when cross-reactive foods are consumed. Different pollens are associated with specific foods. Foods that contain BIRCH POLLEN PROFILIN include: almond, apple, carrot, celery, cherry, hazelnut, kiwi, peach, peanut, pear, plum, potato, and soy. A reaction to several of these foods may indicate general reactivity to BIRCH POLLEN PROFILIN rather than reactivity to specific food antigens or families. Refer to the RMA Food Sensitivities and Cross-Reactions document for more information on cross-reactions.

SEVERAL LIPID TRANSFER PROTEIN CONTAINING FOODS ARE ELEVATED: Lipid transfer proteins (LTPs) are heat and acid stable, and therefore retain potential allergenicity after cooking or upon ingestion. Foods that have documented cross-reactivity via LTPs include: apple, celery, corn/maize, grape, hazelnut, kiwi, legumes, lettuce, peach, peanut, rice, soy, sunflower, and walnut. Refer to the RMA FST Food Sensitivities and Cross-Reactions document for more information on cross-reactions.

REACTIVITY TO CRUSTACEA AND/OR MOLLUSCA: Reaction to Crustacea and/or Mollusca (even in the absence of exposure to, or with strict avoidance of), may indicate cross-sensitivity to TROPOMYOSIN, an allergenic protein found in insects and arachnids. Dust mites and cockroaches are common tropomyosin-containing allergens. If the clinician determines that exposure to tropomyosin could be contributing to clinical symptoms, measures to reduce exposure to insect and arachnid antigens may be recommended. Refer to the RMA FST Food Sensitivities and Cross-Reactions document for more information on cross-reactions.

ELEVATED REACTIONS TO FOODS: Interpretation comments are provided for certain foods. Comments appear when related foods give seemingly inconsistent results (e.g. casein normal and cow's milk high) and for reactive foods that are not commonly found in the North American diet. Refer to the FST Patient Guide Book for commentary on sources of individual foods or food categories.



ORDER BY REACTIVITY Report

ELEVATED FOODS

126	Milk (Cow)	102	Casein	90	Carob
79	Barley	79	Milk (Sheep)	77	Pea
70	Cola Nut	69	Agar Agar	68	Milk (Goat)
67	Ginkgo	63	Gliadin	57	Orange
55	Almond	55	Oat	51	Plum
47	Aloe Vera	46	Alga Espaguette	43	Curry (Mixed Spices)
43	Spelt	42	Hazelnut	41	Cocoa Bean
40	Malt	39	Buckwheat	37	Radish
33	Cinnamon	33	Fig	31	Tiger Nut
30	Mustard Seed				

BORDERLINE FOODS

76	Egg White	54	Yeast (Brewer's)	48	Wheat
46	Bean (Red Kidney)	46	Corn	43	Bean (White Haricot)
38	Peanut	29	Durum Wheat	29	Wheat Bran
27	Sunflower Seed	25	Cabbage (Savoy/White)	24	Brazil Nut
24	Cashew Nut	24	Mussel	24	Potato

NORMAL FOODS

29	Pistachio	23	Yeast (Baker's)	22	Clam
22	Couscous	21	Apricot	21	Avocado
21	Mackerel	21	Papaya	21	Rice
19	Celery	18	Alga Wakame	18	Horse
18	Pineapple	18	Raspberry	18	Squash (Butternut/Carnival)
18	Tangerine	18	Trout	17	Cane Sugar
17	Carp	17	Cranberry	17	Hops
17	Lime	17	Pomegranate	17	Rye
17	Yuca	16	Bean (Broad)	16	Black Currant
16	Mint	16	Walnut	15	Coffee
15	Guava	15	Nectarine	15	Plaice
15	Rosemary	15	Shrimp/Prawn	15	Soy Bean
14	Nutmeg	14	Pine Nut	14	Rabbit
14	Raisin	14	Sage	14	Snail (Sea Snail/Winkle)
13	Chard	13	Cherry	13	Lentil
13	Mango	13	Peppercorn (Black/White)	12	Artichoke
12	Chestnut	12	Chicken	12	Egg Yolk
12	Red Currant	11	Basil	11	Leek
11	Licorice	11	Oyster	11	Peppermint
11	Salmon	11	Tarragon	10	Brussels Sprout
10	Ginger	10	Grape (Black/Red/White)	10	Rhubarb
10	Shallot	10	Thyme	10	Turnip
10	Venison	9	Amaranth	9	Bass
9	Caper	9	Cucumber	9	Herring
9	Mushroom	8	Bayleaf	8	Caviar
8	Flax Seed	8	Lemon	8	Lychee
8	Milk (Buffalo)	8	Tea (Black)	8	Tomato
8	Watermelon	7	Banana	7	Barnacle
7	Bean (Green)	7	Chickpea	7	Duck
7	Grapefruit	7	Olive	7	Scallop
7	Sea Bream (Red)	7	Sole	7	Strawberry
7	Sweet Potato	7	Tea (Green)	7	Veal
6	Apple	6	Arugula	6	Broccoli
6	Cabbage (Red)	6	Cauliflower	6	Cod
6	Dill	6	Eggplant	6	Ginseng
6	Pear	6	Pike	6	Quail
6	Spirulina	6	Turkey	6	Wild Boar
5	Blackberry	5	Camomile	5	Carrot
5	Cayenne	5	Chicory	5	Cuttlefish
5	Melon (Galia/Honeydew)	5	Ostrich	4	Anchovy
4	Beet	4	Bell Peppers	4	Beta-Lactoglobulin (whey)
4	Cockle	4	Cumin	4	Lettuce
4	Monkfish	4	Peach	4	Pork
4	Red Chili Pepper	4	Sea Bream (Gilthead)	4	Spinach
4	Squash, Summer	4	Swordfish	3	Aniseed
3	Asparagus	3	Beef	3	Coconut

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NORMAL FOODS

3	Coriander (Leaf)	3	Date	3	Fennel (Leaf)
3	Haddock	3	Mulberry	3	Octopus
3	Parsley	3	Partridge	3	Polenta
3	Quinoa	3	Vanilla	3	Watercress
2	Alpha-Lactalbumin (whey)	2	Canola	2	Crab
2	Eel	2	Garlic	2	Goat
2	Honey	2	Kiwi	2	Lobster
2	Marjoram	2	Onion	2	Ox
2	Perch	2	Razor Clam	2	Saffron
2	Squid	2	Turbot	1	Clove
1	Lamb	1	Nettle	1	Sardine
0	Blueberry	0	Hake	0	Macadamia Nut
0	Millet	0	Sesame Seed	0	Tapioca
0	Transglutaminase	0	Tuna		

Understanding the Reference Ranges

What Do the Numbers Mean?

The Majority of the foods tested in the RMA FST™ test fall within the following ranges:

- Green: 0 to 23 U/mL
- Yellow: 24 to 30 U/mL
- Red range: 31+ U/mL

However, there are 19 foods tested that have different reporting thresholds.

Why Are the Reporting Thresholds for Some Foods Different?

When we graph the ranked reactivities of most foods for a large population, we observe a fairly consistent curve (Figure 1). The inflection point of the curve, where reactivity increases markedly, tends to occur about the 75th percentile, which coincides with a result of 30. In other words, approximately 25 out of 100 people tested will have a result of 30 or higher.

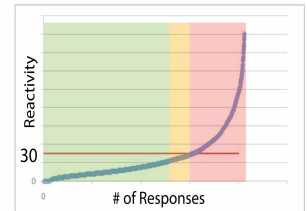


Figure 1 Population Research Curve for Most Foods

Based on statistical analysis of a large body of patients tested at RMA, the reporting thresholds of some foods do not fit the pattern shown in Figure 1; instead, a result of 30 appears very "early" in the distribution. Therefore, the reporting thresholds for those foods are different in order to reserve a red result for those patients whose result for that food lies in the top quartile of the population (shown in Figure 2). These thresholds also allow the practitioner more leeway to interpret the findings in the context of his or her clinical experience. See the list of foods and their associated reference ranges below.

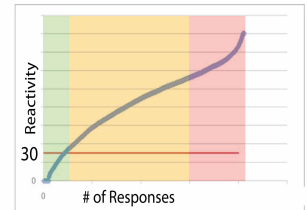


Figure 2 Population Research Curve for Different Foods

Foods with Different Reporting Thresholds

Updated Foods	Green Range	Yellow Range	Red Range
Agar Agar	0 to 30	31 to 54	55+
Almond	0 to 30	31 to 49	50+
Barley	0 to 30	31 to 49	50+
Bean, Red Kidney	0 to 30	31 to 47	48+
Bean, White Harricot	0 to 30	31 to 44	45+
Casein	0 to 30	31 to 97	98+

Updated Foods	Green Range	Yellow Range	Red Range
Cola Nut	0 to 30	31 to 58	59+
Corn (Maize)	0 to 30	31 to 46	47+
Egg White	0 to 30	31 to 99	100+
Gliadin	0 to 30	31 to 50	51+
Hazelnut	0 to 30	31 to 37	38+
Milk (Cow)	0 to 30	31 to 114	115+

Updated Foods	Green Range	Yellow Range	Red Range
Milk (Goat)	0 to 30	31 to 64	65+
Milk (Sheep)	0 to 30	31 to 66	67+
Pea	0 to 30	31 to 66	67+
Peanut	0 to 30	31 to 43	44+
Pistachio	0 to 30	31 to 50	51+
Wheat	0 to 30	31 to 66	67+
Yeast (Brewer's)	0 to 30	31 to 58	59+