What the FIT?!

The Food Inflammation and Leaky Gut Link

Emily Birch

KBMO Diagnostics UK

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What are we covering today?

- What is food inflammation?
- What is ‘Leaky Gut’?
- The connection between food sensitivities and intestinal permeability
- Gut barrier integrity markers
- How to assess food inflammation and gut barrier status in your clients
- What next? Transferring data to clinical practice

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Meet the Team

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Food-mediated inflammation

Leaky Gut

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Inflammation

The immune system's response to a stimulus

Acute: e.g., Sprained ankle, cut or graze, insect sting, sinusitis, bronchitis, bacterial infection
Chronic: e.g., Autoimmune conditions, IBD, asthma, periodontitis

TRIGGER
Barrier breach

RESPONSE
Pathogen / danger recognition (innate)

REACTION
Inflammatory response

OUTCOME
Resolution or chronic inflammation

MEMORY
Specific, memory-based immunity (adaptive)

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What is food inflammation?

The immune system's response to a *specific food(s)*

Also referred to as 'food sensitivity'.

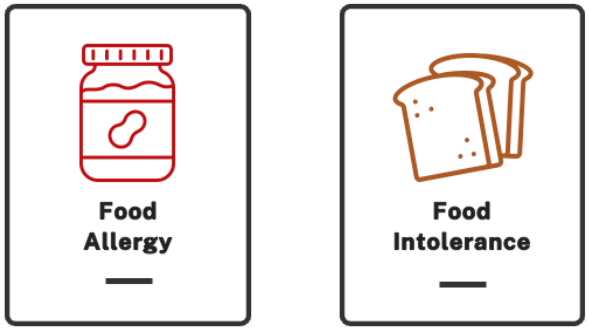
- A driver of low-grade, chronic inflammation (not always dramatic, but persistent)
- Delayed sensitivity reaction - can occur hours to days after consumption.
- Often / usually connected to gut barrier health (the site of the barrier breach)
- Symptoms vary widely between individuals. Often multi-symptom, not always obvious.

Not food allergy (IgE-mediated)

- Reactions are not immediate
- Not life-threatening

Not food intolerance (non-immune)

- Enzyme (e.g., lactase) deficiency, histamine intolerance, FODMAP malabsorption



But, not just sensitivity without consequences…

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Why test food sensitivities?

Weight Loss & Thyroid Issues

Digestive & Skin

Fibroids, Endometriosis & PCOS

Bone Health

Brain Fog, Fatigue & Migraines

Addressing trigger foods can be a major turning point

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Food sensitivity tests – I know what you're thinking..!

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Why is isolated IgG testing problematic?

1. IgG antibodies are found in healthy adults so most likely reflect exposure
2. High rate of false positives
3. Unnecessary dietary restrictions

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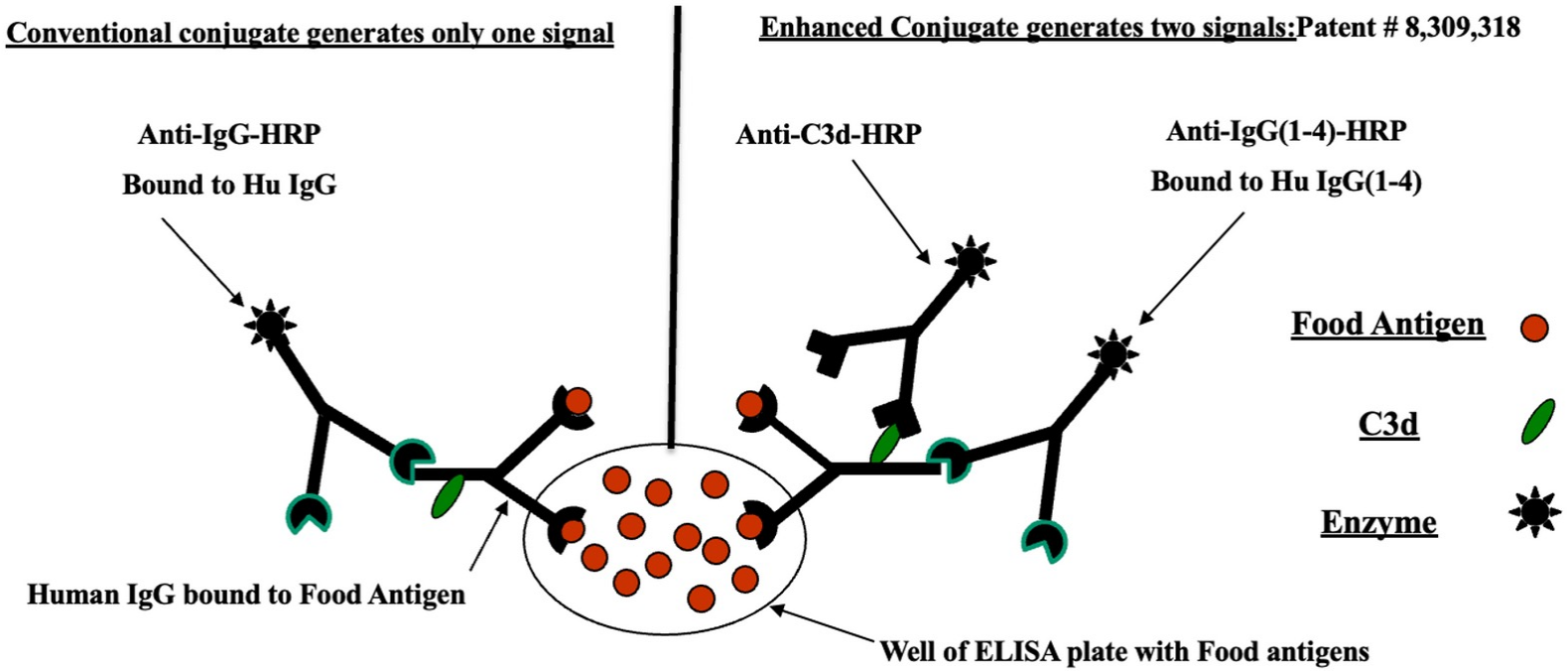
Technology for Enhanced Sensitivity



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The Food Inflammation Test (FIT)

The immune system provides 3 levels of defence

The FIT and Gut Barrier Panel tests all of these:

1. Barriers

Prevent Entry

- Skin & mucus membranes
- Stomach acid & digestive enzymes
- Beneficial bacteria that live in the colon (the gut microbiota)

2. Innate Immunnity

General Defence

- WBCs called neutrophils & macrophages engulf & destroy foreign invaders & damaged cells

3. Adaptive Immunity

Specific Defence

- WBCs (T lymphocytes or T cells) target & destroy infected or cancerous cells
- WBCs called B lymphocytes (B cells) & plasma cells produce antibodies that target & destroy infected /cancerous cells

(Informed Health, 2023 and Paludan et al., 2020)

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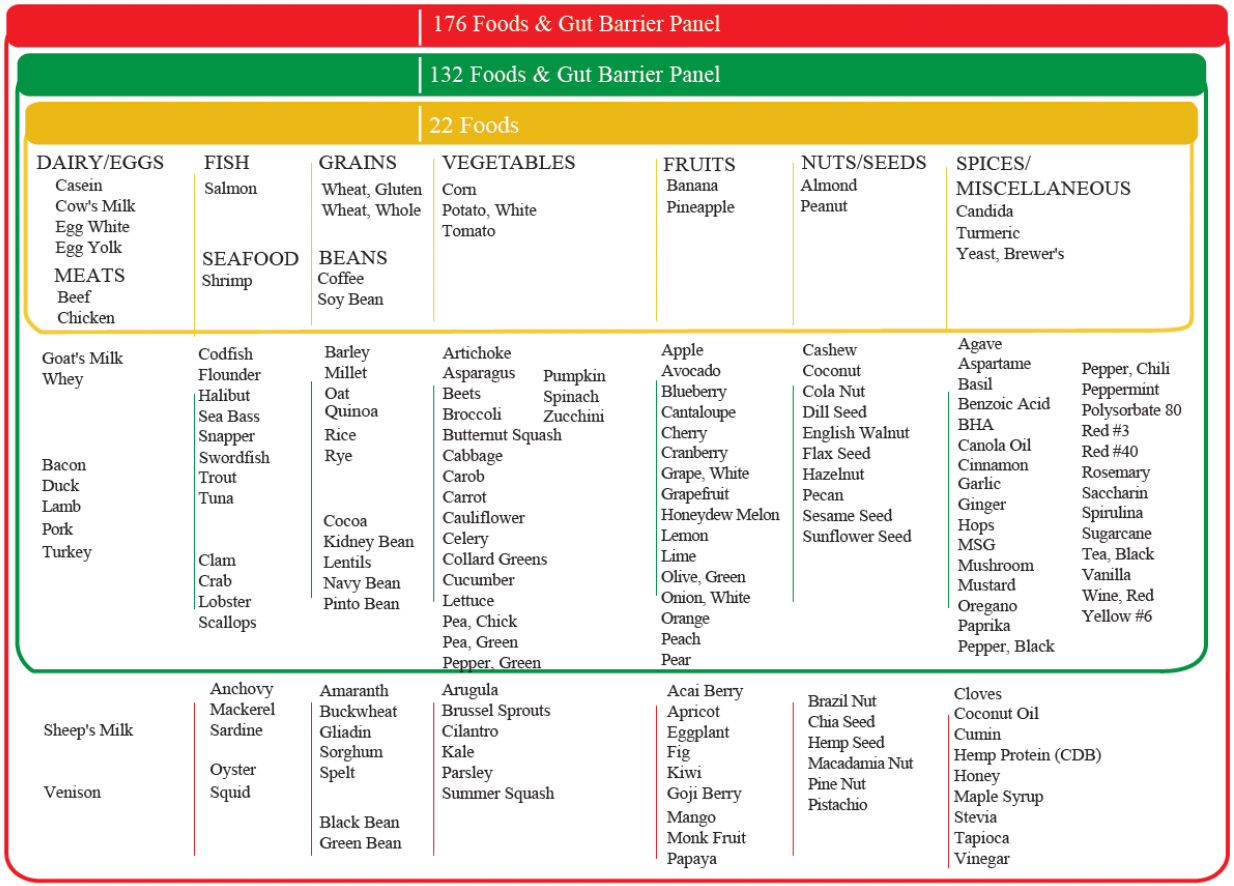
Foods We Test



Food selection contains ‘real-world’ foods, encompassing raw and cooked.

All FIT tests include the Gut Barrier Panel.

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Summary of FIT Tests

FIT22

22 of the most common food sensitivities including gluten, cow's milk and egg plus the Gut Barrier Panel

FIT176

176 foods including health foods such as honey, stevia and coconut oil plus the Gut Barrier Panel

FIT132

132 foods and food additives plus the Gut Barrier Panel

GBP

Assess the integrity of the gut lining by measuring Candida, Zonulin, Occludin and Lipopolysaccharides (LPS)

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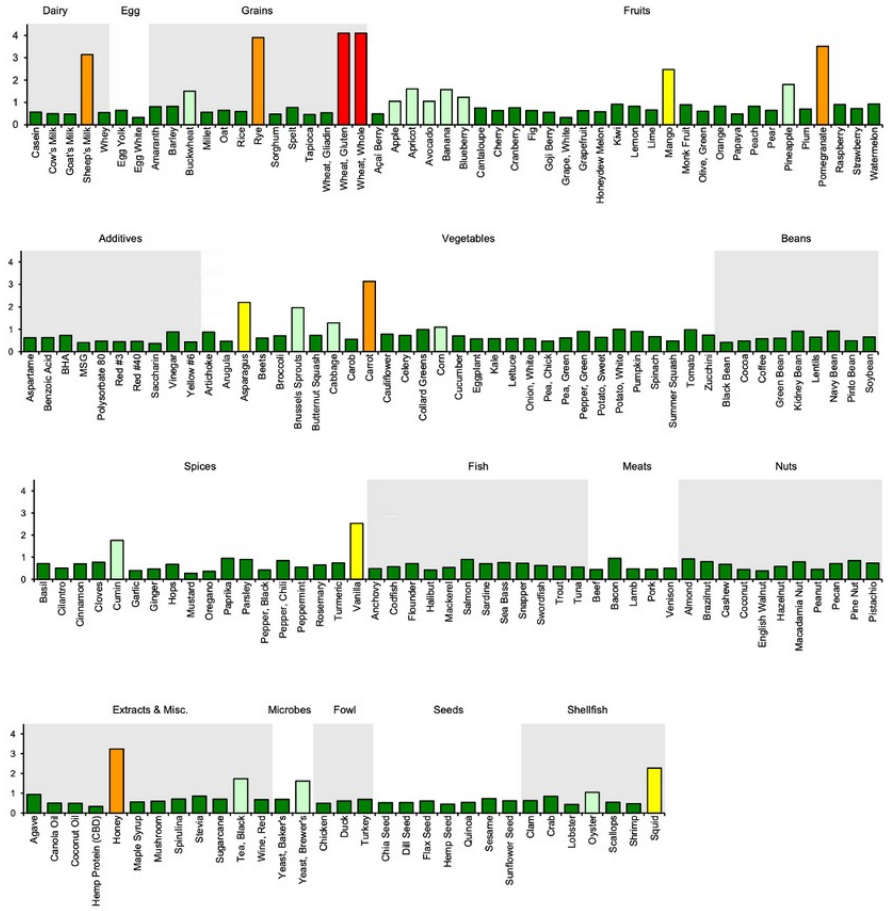
The FIT Report



4+ Reactions:	Wheat, Gluten Wheat, Whole
3+ Reactions:	Sheep's Milk Rye Pomegranate Carrot Honey
2+ Reactions:	Mango Asparagus Vanilla Squid

- Colour coded
- Practitioner-friendly
- Client-friendly
- Easy to interpret

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Easy Interpretation

4+ Reactions:	Wheat, Gluten Wheat, Whole
3+ Reactions:	Sheep's Milk Rye Pomegranate Carrot Honey
2+ Reactions:	Mango Asparagus Vanilla Squid

Foods are split into clear categories: those with measurable immune reactivity (1+ to 4+) and foods that show no measurable reactivity.

Each food is colour-coded and graded based on reactivity intensity:

Red	+4	Highest immune reactivity
Orange	+3	Strong reactivity
Yellow	+2	Moderate reactivity
Light Green	+1	Low grade reactivity
Dark Green	+0	No reactivity (safe to consume)

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Not all ‘healthy’ foods are anti-inflammatory!

List of Restricted Foods:	
4+ Reactions:	Cranberry Pineapple Garlic
3+ Reactions:	Benzoic Acid Lettuce Sardine
2+ Reactions:	Casein Carrot Oyster Shrimp

List of Restricted Foods:	
4+ Reactions:	Lettuce Brazilnut Spirulina
3+ Reactions:	Kidney Bean Anchovy Lobster
2+ Reactions:	Rice Apricot Pomegranate Flounder Sea Bass Lamb Turkey

List of Restricted Foods:	
4+ Reactions:	Pepper, Green Potato, White Cashew Peanut Pistachio
3+ Reactions:	Apricot Monk Fruit Tomato Zucchini
2+ Reactions:	Pomegranate Watermelon Pine Nut

List of Restricted Foods:	
4+ Reactions:	Banana
3+ Reactions:	Avocado Asparagus Collard Greens Kale Cumin
2+ Reactions:	Blueberry Lime Pomegranate Artichoke Arugula Vanilla Cashew

List of Restricted Foods:	
4+ Reactions:	Egg Yolk Egg White Shrimp
3+ Reactions:	Casein Clam
2+ Reactions:	Wheat, Gluten Olive, Green Strawberry Wine, Red Crab Scallops

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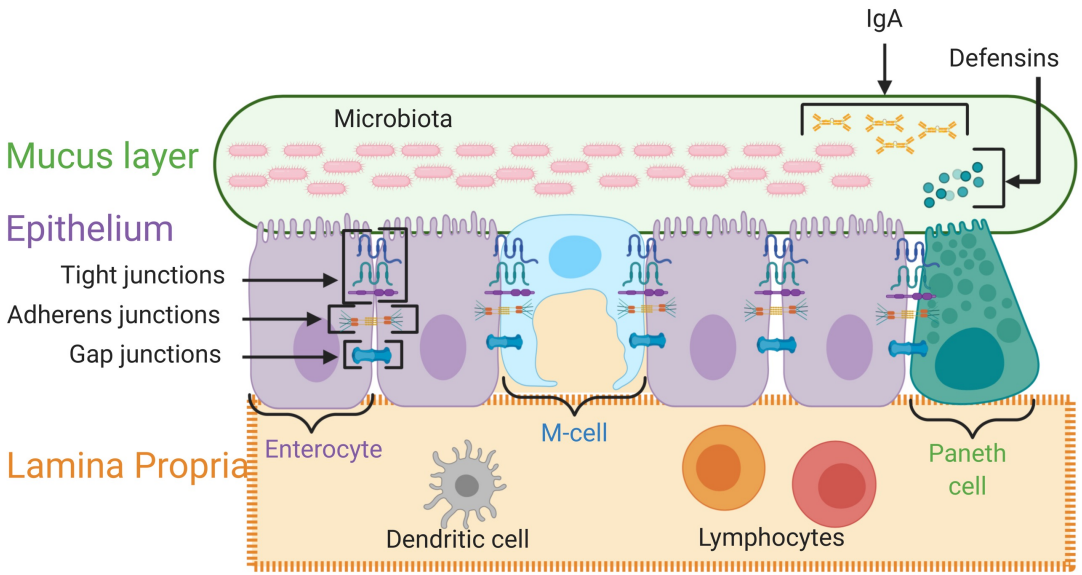
The Intestinal Barrier



- The first line of defence against pathogens and food antigens
- The intestinal epithelium is a single-cell layer
- Dynamic and selectively permeable – nutrients, electrolytes and water can freely pass through. Macromolecules, toxins, food allergens, antigens, pathogens and enteric flora cannot (ideally!)
- Maintains its selective barrier function via complex protein-protein networks that physically link adjacent cells and seal the intercellular space
- Maintaining the integrity of the intestinal barrier is key for your clients' wellbeing.

Source: Sharma & Riva, 2022

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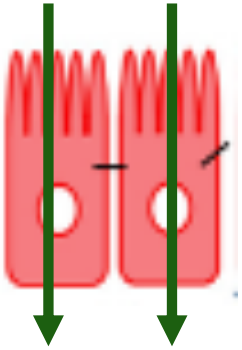
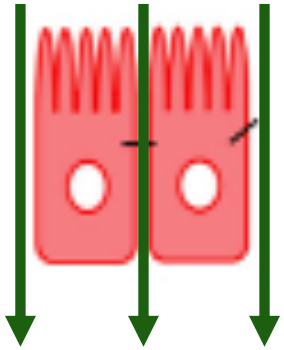
Intestinal Permeability



Transcellular pathway: Movement **through** the intestinal epithelial cells. Sugars, amino acids, vitamins, larger proteins and bacterial components.
Increased transcellular permeability has been implicated in bacteria, endotoxins and LPS crossing the intestinal epithelium.



Paracellular pathway: Movement **between** the intestinal epithelial cells. Used by ions, water and larger hydrophilic compounds. Transport across this space is regulated by tight junction proteins, which form a physical barrier to ensure selective permeability. Altered barrier function is also implicated in larger proteins (e.g., food proteins), bacteria, endotoxins and LPS crossing the intestinal epithelium and can also affect transcellular uptake.

Tight junctions are made up of transmembrane proteins (e.g., occludin), which interact with zonula occludens scaffold proteins.

Tip: Zonula occludens is the physical gate or barrier, while zonulin is the key (signaling molecule) that opens and closes it.

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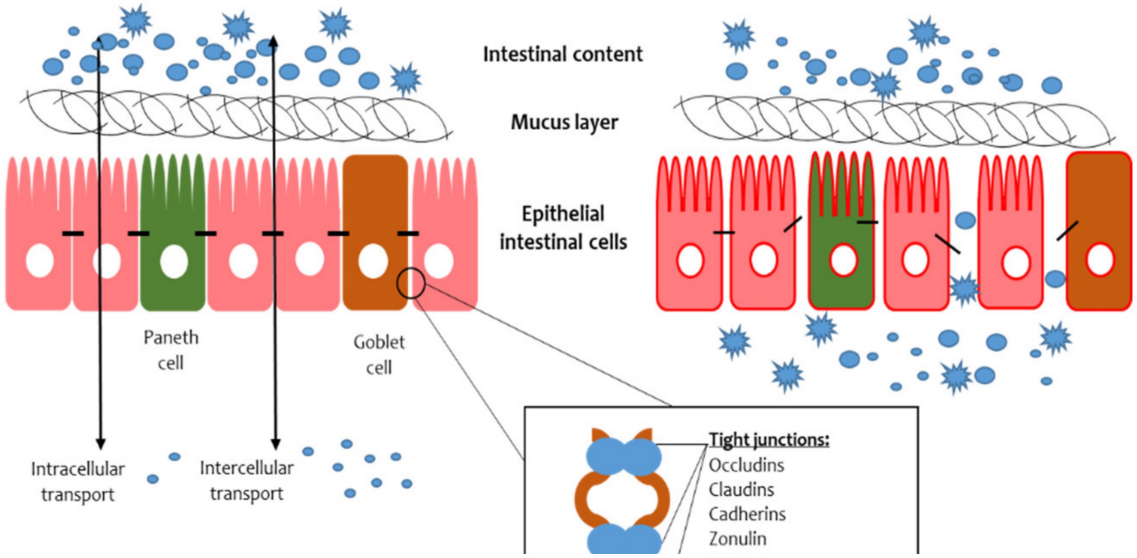
(Increased) Intestinal Permeability
'Leaky Gut Syndrome'



Source: Kocot, Jarocka-Cyrta & Drabinska, 2022

- Typically refers to compromised epithelial tight junctions.
- The lining of the small intestine becomes damaged and more porous, allowing toxins, bacteria and other particles to "leak" into the bloodstream.
- Contributes to excessive immune reactions.
- Triggers and mediates systemic inflammation.
- Is associated with a wide range of symptoms, including food sensitivities, bloating, fatigue, headaches, joint pain, skin issues and nutritional deficiencies.
- (Not accepted as a formal medical diagnosis)

Contributing / Risk Factors

Diet: High sugar, saturated fats and processed foods (esp. emulsifiers)
Alcohol: Damages the mucosal layer, contributes to dysbiosis, promotes growth of gram-negative bacteria
Stress: Weakens the immune system, can weaken tight junctions
Medications: Prolonged use of certain medications, such as antibiotics, NSAIDs and aspirin
Age: Barrier function appears to differ with age. A function of normal ageing
Genetics: Some individuals may have a genetic predisposition to a weaker gut barrier
Obesity: Increases inflammatory burden
Dysbiosis: Can alter tight junctions and stimulate mucosa-associated lymphatic tissue (MALT) and activate the inflammatory cascade, which can damage epithelial tissue
Infections: GI infections can be a relevant factor, e.g., H.Pylori is known to increase intestinal permeability.
Autoimmune Conditions: IBD, Celiac disease, Type 1 diabetes
Gluten: Can powerfully stimulate zonulin release (gliadin), which precedes an increase in gut permeability
Mycotoxins: Can disrupt tight junction proteins, disrupt microbiome, impair epithelial regeneration
Pregnancy: Immunological shift, dampens cell-mediated immunity, hormonal changes increase dysbiosis risk, increases requirement of nutrients essential for gut barrier architecture and repair

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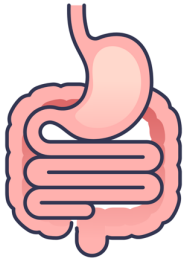
Symptoms associated with Leaky Gut



- Bloating and abdominal distension
- Gas and flatulence
- Abdominal pain
- Early satiety / postprandial fullness
- Nausea
- Diarrhoea
- Nutritional deficiencies
- Food sensitivities

- Fatigue
- Headaches
- Join pain
- Skin conditions
- Anxiety
- Depression
- Brain fog
- Cognitive changes
- Frequent illness
- Thyroid dysfunction
- Weight changes / difficulties

Note: Studies point towards correlative data, not causation.

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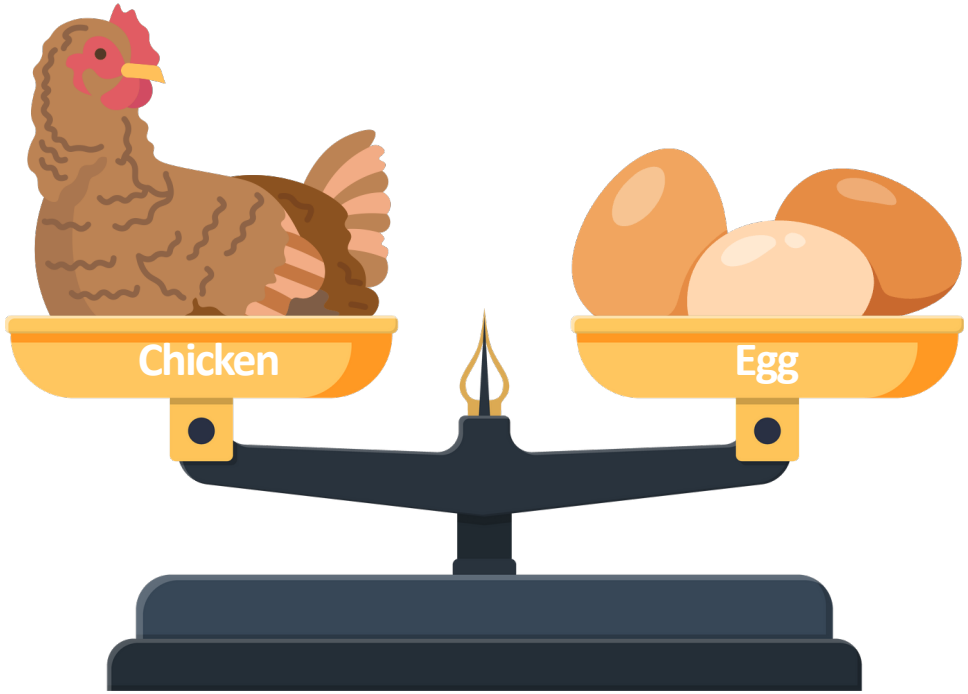
Food sensitivity or leaky gut: which came first?



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Q. How do you know you're dealing with food inflammation and/or increased intestinal permeability?

Q. How do you know which foods are triggering an immune response for your client?

Q. How do you know where to start and what to focus on?

Test, don't guess!

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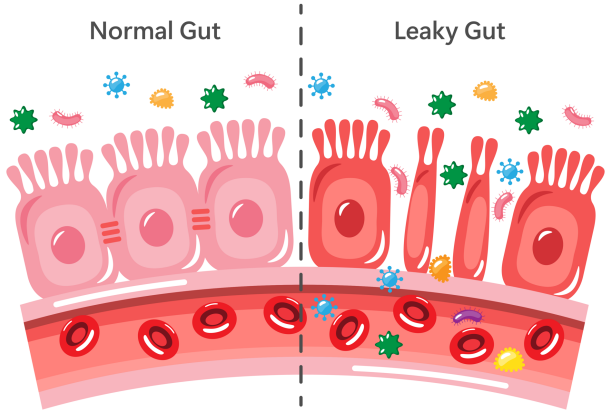
Gut Barrier Panel				
	IgG1-4+C3d		IgA1-2	
		Cut off		Cut off
Candida	Negative		Positive	
Zonulin	Negative		Positive	
Occludin	Negative		Negative	
LPS	Negative		Positive	



Our unique Gut Barrier Panel acknowledges that leaky gut occurs across a spectrum and includes the gatekeeper markers: Candida, Zonulin, Occludin and Lipopolysaccharide (LPS).

For each marker we measure IgG 1-4 / C3d, in addition to IgA 1-2.

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Candida

Naturally occurring yeast, residing in the GI tract as part of the normal microbiome. Overgrowth is problematic.

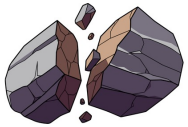
We measure and use any candida overgrowth in the stomach/dysbiosis as a precursor to leaky gut occurrence

Zonulin

A marker of intestinal permeability. We use unique next generation Zonulin IgG **antibody** screening – a more stable and specific marker, exclusive to KBMO.

Developed by Dr Alessio Fasano & Dr Brent Dorval

Occludin



A marker of intestinal tight junction stabilization and optimal barrier function.

Elevated occludin indicates that the tight junctions between intestinal epithelial cells are breaking down

LPS

Potent endotoxin, present in outer surface membrane of gram-negative bacteria - many of which are pathogenic.

Major inducer of inflammatory response - triggers inflammatory cytokine release, can create direct epithelial damage in the gut, crosses the blood brain barrier.

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Zonulin	Positive		Positive	
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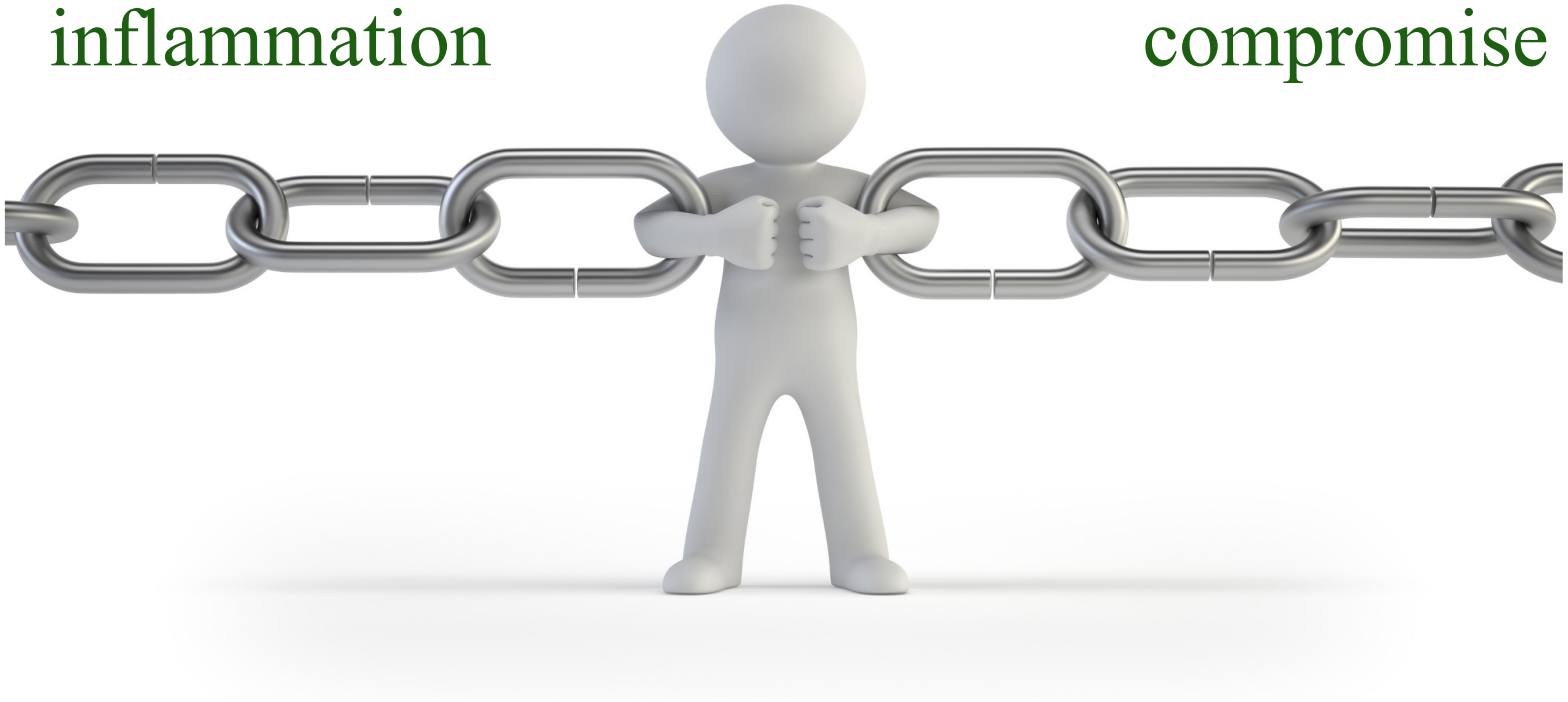
Food-mediated inflammation

Gut Barrier compromise



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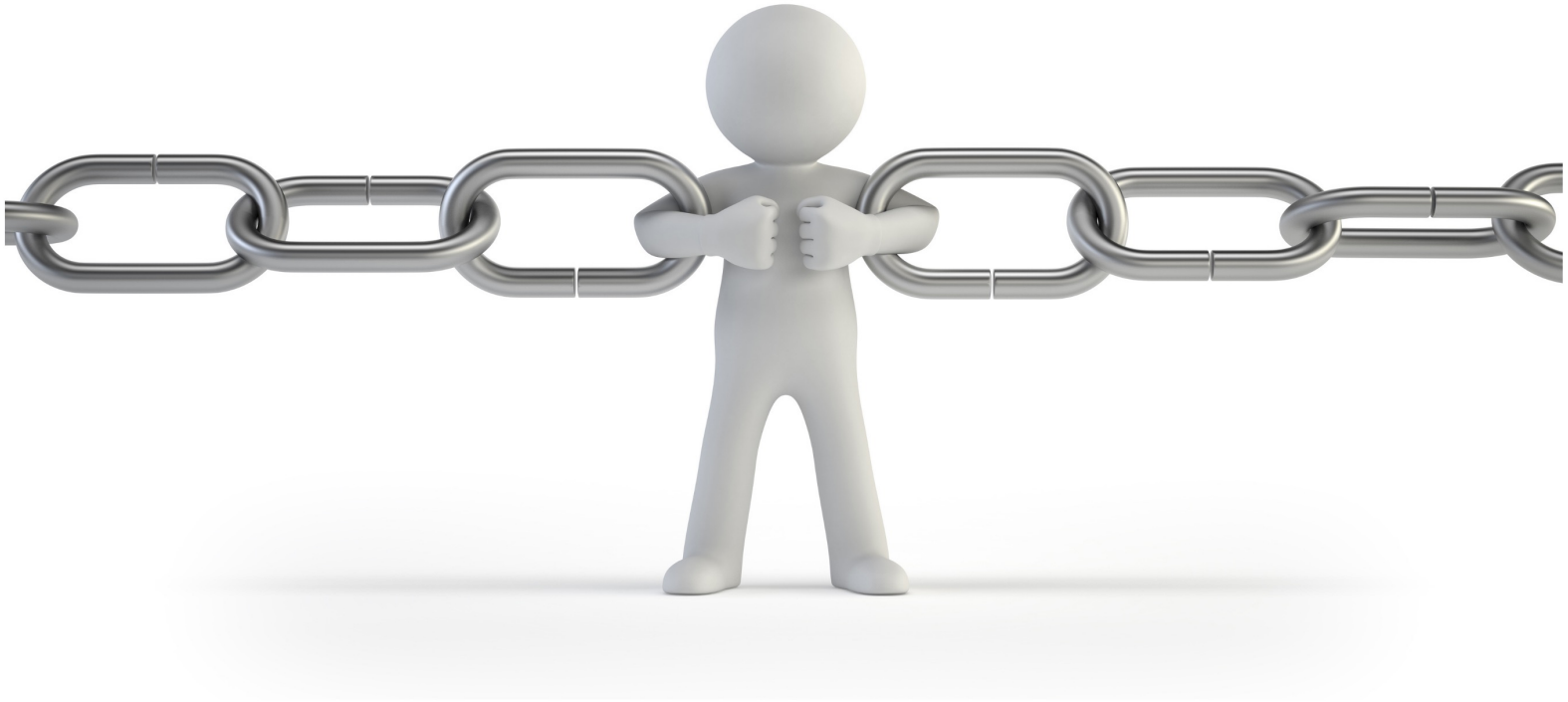
What now?!



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Revisit the contributing / risk factors

Diet: High sugar, saturated fats and processed foods (esp. emulsifiers)
Alcohol: Damages the mucosal layer, contributes to dysbiosis, promotes growth of gram-negative bacteria
Stress: Weakens the immune system, can weaken tight junctions
Medications: Prolonged use of certain medications, such as antibiotics, NSAIDs and aspirin
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Gut Barrier Support

Optimise dietary fibre

Polyphenol-rich diet - berries, pomegranate, blackcurrant, green tea, cacao

Gut Supporting nutrients - Glutamine, Glycine, Zinc, EFA's, A, B vitamins, tryptophan

Mucopolysaccharides / glucosaminoglycans - Bone broth, fish/poultry skin, flaxseeds, aloe vera, oats, okra, medicinal mushrooms, apples, citrus peel, slippery elm, marshmallow

Address food sensitivities / food-mediated inflammation - Eliminate & rechallenge

Mindful eating

Stress reduction, sleep optimisation, breathing techniques

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Fabulous Fibre

"Warrants attention as a potentially relevant dietary intervention to reduce intestinal permeability."

- Contains microbiota-accessible carbohydrates (MACs), shown to enhance expression of tight junction proteins.
- Gut microbiota produce short-chain fatty acids (SCFAs) as a fermentation product.
- SCFAs may improve intestinal barrier function by modulating the size and function of the T-cell network in the gut, supporting intestinal epithelial cell proliferation, inducing mucus secretion, protecting gut barrier integrity and providing the primary energy source for colonocytes.

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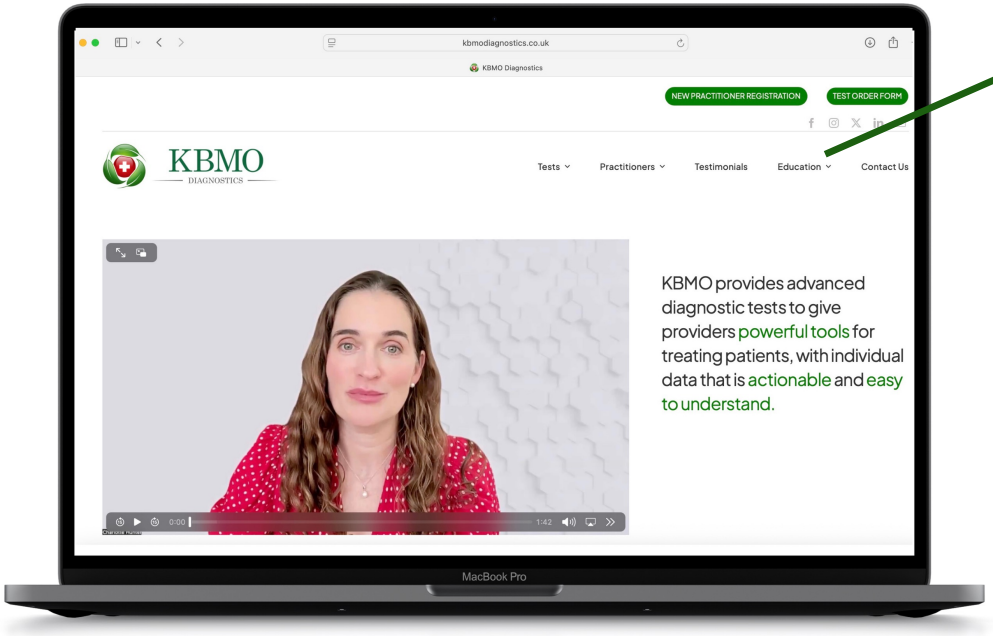
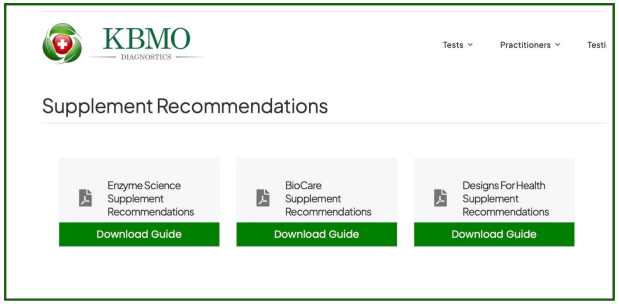
Supplement Guidance





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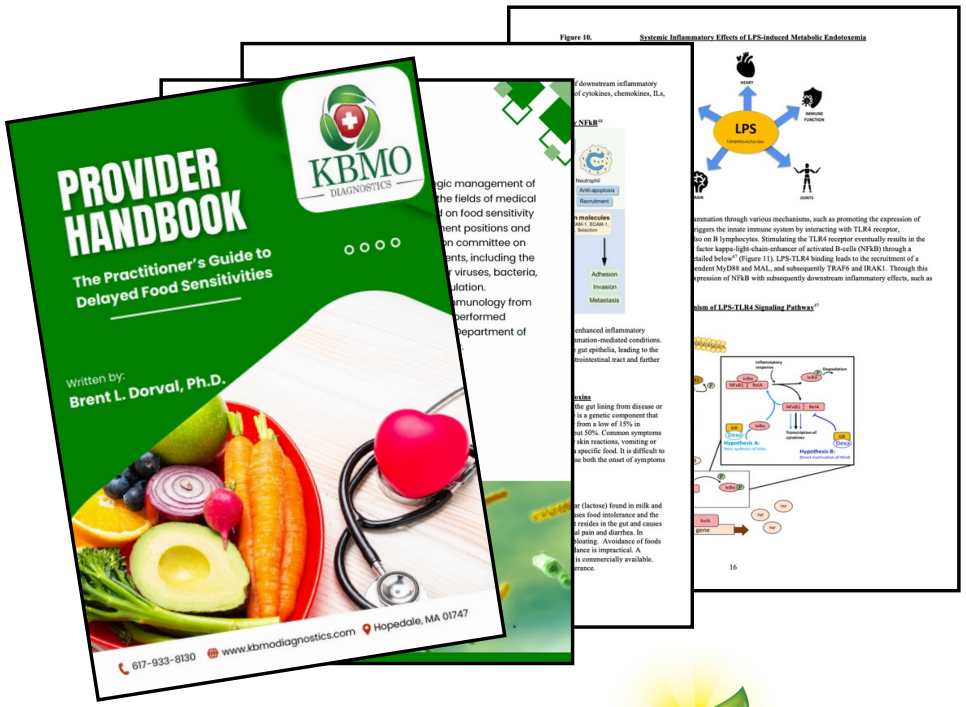
Clinical Support



- East to read patient reports
- Educational videos and webinars
- Provider handbook
- Supplementary handouts and leaflets
- Supplement protocols
- Website resources
- Support calls

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FIT - A powerful tool for your practice

- Useful pre- initial consultation screening tool for every client
- Data you can use straight away
- Improves client engagement & compliance
- No guess with with problematic foods from the get-go
- It’s not a ”so what?” test, it’s insightful and useful
- Financial benefit for you, with a practitioner mark-up of your choice
- Clear, concise reports mean less need for long support calls and assistance = freeing up your time

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When to be cautious

- ! Not for IgE-mediated allergy or anaphylaxis risk
- ! Not for Coeliac disease diagnosis
- ! Caution in eating disorder risk
- ! Must always include elimination – rechallenge
- ! Use in broader clinical context only, not as standalone ‘diagnosis’

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Thank You

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