

GASTROINTESTINAL IMPACT ON NUTRIENT AND TOXICANT STATUS

Proper gastrointestinal (GI) function is critical to adequate nutritional status and can impact all aspects of body function. Approximately one-third of daily caloric expenditure is required to drive the digestive, assimilative and immune functions while maintaining the gastrointestinal tract.¹ A large amount of the body's total

lymphatic tissue is located in the gut, and the gastrointestinal system is the only organ system of the body with its own independently working lymphatic and nervous systems. Only a system of prime importance to overall health would have such a large number of total-body resources dedicated to it.²⁻⁶

Failures of the gastrointestinal system manifests as various digestive diseases, such as gastroesophageal reflux disease (GED), irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), non-alcoholic

TABLE 7.1 — SUMMARY OF LABORATORY EVALUATIONS FOR GASTROINTESTINAL FUNCTION

GI Aspect	Function	Testing	Abnormal	Intervention
Stomach	Gastric acid, Pepsin	Heidelberg capsule Direct pH readings	↓ pH	<ul style="list-style-type: none"> – Mucosal building protocol – Betaine HCl – Free-form amino acids (see Chapter 4, "Amino Acids") – B-vitamins – Trace elements (see Chapter 3, "Nutrient and Toxic Elements")
		Indirect indicators	Multiple ↓ trace elements or amino acids	
Pancreas	Protease	Fecal chymotrypsin	↓ Activity	Pancreatic replacement enzymes (proteolytic, lipolytic and amylolytic) and essential fatty acids
		PABA index	↓ Index	
	Lipase	Plasma fatty acids	↓ PUFA	
		Fecal fats	↑ Fat	
Liver/ Gallbladder	Bile acid secretion	Fecal fatty acids	↑ Fatty acids	Ox bile, choleric herbs (milk thistle) and essential fatty acids
Small intestine	Absorption	Schilling test	↓ Urinary B ₁₂	B ₁₂ by injection or ≥ 1,000 µg/d sublingual
		Lactulose-Mannitol challenge	↓ Urinary mannitol	Mucosal restoration
		Fasting plasma amino acids	Multiple low values	Essential amino acid mixtures
		Food-specific IgG	Multiple elevations	Food elimination/Rotation diets
Colon	Water resorption, Microbial containment	Fecal butyrate or other SCFA	↓ Butyrate	Increase dietary fiber
			↑ Isobutyrate	Butyrate enemas
Immune barrier	Glycocalyx antigen binding Allergy-antigen elimination	Serum, urinary or fecal IgA	↑ Food-specific IgA	Eliminate offending antigens
		Serum IgE	↑ Total IgE	Immune-support nutrients such as <i>Glycyrrhiza glabra</i> (licorice) root or L-glutamine 3,000–6,000 mg daily
Physical barrier	Regulate nutrient admission and restrict toxicant and microbial access	Serum IgG	Many + foods	Eliminate + foods by group (Rotation Diet) Add free-form amino acids and glutamine Zinc 50–100 mg/d, B ₅ 100–200 mg/d
		Lactulose-Mannitol challenge	↑ Urinary Lactulose ↓ Mannitol	Eliminate + foods Mucosal restoration
Microbial populations	Normal: nutrient delivery	Urinary metabolic markers	↑ Bacterial markers	Herbal or pharmaceutical antibiotics (e.g., berberine alkaloids, etc.)
	Pathogen: toxin production	Hydrogen-Methane breath test	↑ Protozoal markers	Prebiotics and probiotics with antiprotozoals
			↑ Yeast markers	Restrict simple sugars with antifungals
			↑ Expired gases	Herbal or pharmaceutical bacteriostatic agents
	Stool microbial DNA quantitation or culture & sensitivity	↑ Growth	Specific antibiotics	