PATIENT

NAME: **TEST2 PATIENT** GENDER: **Male**
DATE OF BIRTH: **01/11/1998** AGE: **22**

ACCESSION ID: **2006240006**
SPECIMEN COLLECTION TIME: **06-23-2020 15:38**
SPECIMEN RECEIVED TIME: **06-24-2020 09:38**
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FASTING: **FASTING**

PROVIDER

PRACTICE NAME: **Vibrant IT4 Practice**
PROVIDER NAME: **Demo Client, DDD (999994)**
ADDRESS: **TEST STREET, TEST CITY, KY- 42437.**

Vibrant Wellness is pleased to present to you **Gut Zoomer** testing to help you make healthy lifestyle choices in consultation with your physician and dietitian. It is intended to be used as a tool to encourage general healthy lifestyle choices.

Gut Zoomer 3.0 is a health analytics tool based on the gut microbiome which provides potential risks for intestinal permeability, cardiovascular, metabolic, neurological, intestinal, autoimmune, liver, hormonal, and nutritional health conditions. Additionally it has panels for detection of gut pathogens and digestive markers. It is intended to be used to improve functions associated with a general state of health, and where it is well understood as well as accepted that healthy lifestyle choices may play an important role in these health outcomes.

Interpretation of Report: The following terminologies are used consistently in the report and are explained below.

Gut Diversity is an indicator for the amount of individual bacteria from each of the bacterial species present in your gut microbiome. There are two indices calculated including Shannon's Index (Scale 0-3) and Simpson's Index (Scale 0-1). For both calculations, higher index value represents increased diversity of species. While Shannon's is a better indicator of 'Richness' of the diversity, Simpson's is a better indicator of 'Evenness'. For Shannon's Index, the reference range for high diversity is >= 2.5 units, for moderate diversity is 1.5 - 2.5 units and for low diversity is <= 1.5 units. For Simpson's Index, the reference range for high diversity is >= 0.75 units, for moderate diversity is 0.5 - 0.75 units and for low diversity is <= 0.5 units. The calculated Index values are surrounded with a risk indicator (Green – high diversity, Yellow – moderate diversity, and Red – low diversity).

Gut Phyla distribution is displayed in a pie chart with each pie representing the % of individual phyla tested.

Key Ratios are calculated and displayed comprising of F/B (Firmicutes to Bacteroidetes ratio) and P/B (Prevotella to Bacteroides ratio), along with the corresponding risk indicator.

Gut Commensal bacteria is represented using relative abundance values. **Relative abundance** is the percent composition of an organism of a particular kind relative to the total number of organisms in your gut microbiome. The abundance of individual bacterial phylum/family/genus/species is calculated by comparing the relative abundance to the healthy reference range. Reference ranges have been established using results from 192 healthy individuals.

In some cases, a high abundance is potentially associated with an increased risk for a condition and in some cases a low abundance is potentially associated with an increased risk for a condition. The abundance is always mentioned in the report along with the potential associated risks, however, it is applicable only when indicated in RED. Associated probiotic tests are displayed in each panel with suggestions based on potential associated risks.

Ratings are calculated based on the impact factor, citations, and study population of the references which correlate the bacterial organism with the associated conditions. It is indicated with a star based system (1 star – 5 stars) with 5 stars indicating the best correlation of the bacteria with the potential associated risk. The impact factor of the journal in which the reference is published is the number of citations received by articles published in that journal during the two preceding years, divided by the total number of articles published in that journal during the two preceding years. Study population includes the number of samples tested along with gender, age, and ethnicity of the population.

Gut Pathogens comprising of pathogenic bacteria, parasites, virus, and fungi are indicated as DETECTED or NOT DETECTED along with the levels in respective units. Worm and antibiotic resistance gene testing is displayed as DETECTED or NOT DETECTED based on the test result.

Inflammation and Digestive Insufficiency markers are displayed along with a risk indicator and the corresponding reference range for each test calculated using results from 192 healthy individuals. All test results are displayed with risk indicator and abundance direction as applicable. (Red – High Risk, Yellow – Moderate Risk and Green – Low Risk).

Vibrant Wellness is a personalized health analytics company founded out of our passion to serve patients and providers. The Vibrant Wellness platform provides tools for you to track and analyze your general wellness profile. All testing offered by Vibrant Wellness is performed at a CLIA approved lab testing facility and licensed by California Department of Public Health.

Please Note - Consider all supplements in relation to medical history and symptoms. Not all recommended supplements are appropriate in all individual cases. It is important that you discuss any modifications to your diet, exercise and nutritional supplementation with your physician before making any changes. Pediatric ranges have not been established for these tests.

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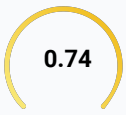
GUT DIVERSITY

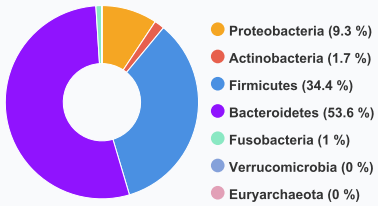
Shannon's Index
Scale: 0 - 3
Ref Range: ≥2.5
Prev value: 1.2



Simpson's Index
Scale: 0 - 1
Ref Range: ≥0.75
Prev value: 0.57

NOTE:
Higher value, Higher Diversity

PHYLA



KEY RATIOS

RATIO	CURRENT	REF RANGE	PREVIOUS 06/24/2020
F/B	0.6	≤0.9	0.6
P/B	1.33	≥0.48	1.03

Consider these supplements in relation to medical history and symptoms. Not all recommended supplements are appropriate in all individual cases. Consult a knowledgeable healthcare provider before taking any supplemental nutrients or probiotics.

GUT COMMENSALS

● Low ● Moderate ● High

TEST NAME	CURRENT	PREV	TEST NAME	CURRENT	PREV
INTESTINAL PERMEABILITY	0.0 2.0 3.9 6.0 ● 2.0	● 3.4	SIBO	0.0 2.0 3.9 6.0 ● 1.7	● 2.4
CARDIOVASCULAR HEALTH	0.0 2.0 3.9 6.0 ● 1.4	● 1.0	AUTOIMMUNE HEALTH	0.0 2.0 3.9 6.0 ● 1.2	● 2.3
METABOLIC HEALTH	0.0 2.0 3.9 6.0 ● 2.2	● 2.3	NUTRITION	0.0 2.0 3.9 6.0 ● 1.3	● 2.0
NEUROLOGICAL HEALTH	0.0 2.0 3.9 6.0 ● 2.3	● 2.0	LIVER HEALTH	0.0 2.0 3.9 6.0 ● 1.9	● 2.1
IBD	0.0 2.0 3.9 6.0 ● 1.5	● 1.7	IBS	0.0 2.0 3.9 6.0 ● 1.1	● 1.3
HORMONES	0.0 2.0 3.9 6.0 ● 0.9	● 1.0			

COMMENTS:
Increased risk for Metabolic health, Neurological Health.
Suggested probiotics include: Lactobacillus paracasei, Saccharomyces boulardii, Lactobacillus salivarius, Escherichia coli Nissle, Bifidobacterium infantis.
Suggested supplements include: Berberine, Origanum vulgare, Wormwood oil, Lemon balm oil, Barberry root extract, glycine, Pantothenic Acid, riboflavin, vitamin B6, folate, vitamin B12, betaine.

GUT PATHOGENS

ORGANISM	DETECTED	RESULT			COMMENTS
		CURRENT	REF RANGE	PREVIOUS	
Bacteria	Clostridium difficile Toxin A	2.5e5	≤1e3	1e6	Consider broad-spectrum antimicrobial herbs including berberine, caprylic acid, garlic oil, oil of oregano, uva ursi, olive leaf extract.
	Plesiomonas shigelloides	7.5e4	≤3e2	3.5e7	Consider broad-spectrum antimicrobial herbs including berberine, caprylic acid, garlic oil, oil of oregano, uva ursi, olive leaf extract.
Antibiotic Resistance Genes	Helicobacter - Clarithromycin	DETECTED		DETECTED	Consider herbal formulas to eradicate or suppress H. pylori. Ingredients may include: deglycyrrhizinated licorice, mastic gum, methylmethionine sulfonium chloride, vitamin C, zinc carnosine, bismuth citrate, berberine, goldenseal, oil of oregano, grape extract, Chinese goldthread extract, yerba mansa extract. Rebuild healthy gastric mucosa by reducing stress and giving soothing and healing agents such as glutamine, aloe, DGL, and vitamin A.

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INFLAMMATION

MARKER	RESULT			COMMENT
	CURRENT	REF RANGE	PREV	
Calprotectin	424.4 mcg/g	≤50.0	417.7 mcg/g	Five polyphenols in particular have evidence of benefit in treating gut inflammation: resveratrol, epigallocatechin, curcumin, quercetin, and Boswellia. Sleep, diet, exercise and stress management should be evaluated. Be cautious with medications such as ibuprofen, acetaminophen, aspirin, especially in children.
Fecal lactoferrin	13.9 mcg/ml	≤6.4	13.9 mcg/ml	Elevated levels have been associated with IBD, diverticulitis or bacterial/parasitic infection leading to mucosal inflammation. Consider anti inflammatories such as fish oils, leukotrine inhibitors, N-acetyl glucosamine and balacing gut diversity with probiotics.
Beta defensin 2	62.2 ng/mL	≤34.9	62.2 ng/mL	Elevated human beta-defensin-2 levels indicate an activation of the innate immune system in patients with irritable bowel syndrome. Consider broad spectrum probiotics to improve gut diversity along with probiotic foods.
Lysozyme	126.6 ng/mL	≤575.0	126.6 ng/mL	
S100A12	26.5 mcg/ml	≤50.0	26.5 mcg/ml	
MMP 9	0.7 ng/mL	≤0.2	0.7 ng/mL	MMP9 is a major inflammatory marker of the gut. Consider supplements such as Curcumin, Coumarin, 4-methylesculetin which are anti inflammatory. Calcium supplementation has shown benefit in reducing epithelial permeability and inflammation in the intestine through reduced expression of MMP-9 in some studies.
Fecal Eosinophil Protein X	2.2 mcg/g	≤4.8	2.2 mcg/g	

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MARKERS OF DIGESTIVE INSUFFICIENCY AND MALABSORPTION

MARKER	RESULT			COMMENT
	CURRENT	REF RANGE	PREV	
Pancreatic elastase 1	190.6 mcg/g	≥200.0	153.5 mcg/g	Consider digestive support with betaine HCL. Consider pepsin, plant or pancreatic enzyme supplements, digestive herbs, bile salts, and taurine. Micronutrient evaluation recommended, especially for fat soluble vitamins A, D, E, and K. Consider eating six small meals per day. Chew thoroughly and relax at meal time. Stay well-hydrated. Avoid alcohol and smoking.
Meat fiber	DETECTED		NOT DETECTED	Detection of undigested fibers is indicative of inadequate chewing, pancreatic or bile insufficiency. Bile acid levels, PE1 along with eating habits should be verified. Pancreatic enzyme , betaine HCL and cholagogues can be considered.
Vegetable fiber	NOT DETECTED		DETECTED	
FAT MALABSORPTION				
Total Fecal Fat	24.7 mg/g	2.9~37.5	24.7 mg/g	
Total Fecal Triglycerides	6.1 mg/g	0.3~2.5	6.1 mg/g	High levels of fecal fat are suggestive of maldigestion or malabsorption. Consider cholagogues, betaine HCL, pancreatic enzyme supplement to improve outcome. Phophatidyl choline, serine and inositol can be considered when phospholipids are low.
Long chain fatty acids	11.8 mg/g	0.9~28.1	11.8 mg/g	
Total Cholesterol	2.3 mg/g	0.5~5.3	2.3 mg/g	
Total Phospholipids	1.6 mg/g	0.3~6.4	1.6 mg/g	

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GUT METABOLITES

MARKER	RESULT			COMMENT
	CURRENT	REF RANGE	PREV	
BILE ACID METABOLITES				
Cholic acid (CA)	0.25 %	≤0.36	0.28 %	
Chenodeoxycholic acid (CDCA)	0.31 %	≤1.25	1.24 %	
Deoxycholic acid (DCA)	32.90 %	24.25~75.84	19.93 %	
Lithocholic acid (LCA)	56.94 %	24.16~75.75	69.62 %	
LCA/DCA ratio	1.73	0.32~3.38	3.49	
SHORT CHAIN FATTY ACIDS				
Acetate	68.2 %	60.2~72.7	62.0 %	
Butyrate	9.8 %	5.1~12.4	2.3 %	
Propionate	17.1 %	15.4~30.3	28.8 %	
Valerate	0.5 %	0.8~3.5	2.8 %	SCFA supplements are most commonly found as butyric acid salts. Herbal medicines that can affect SCFA levels include berberine, passiflora edulis, Chinese Yam, trametes versicolor extract, lotus seed resistant starch, xylooligosaccharides from corn cobs, coptis chinensis, Reishi mushroom, Poria mushroom, Lingzhi mushroom, Daikenchuto. Sleep, diet, exercise and stress management needs to be evaluated. Be cautious with use of antibiotics.
Total Short chain fatty acids	10.2 micromol/g	45.4~210.1	98.1 micromol/g	SCFA supplements are most commonly found as butyric acid salts. Herbal medicines that can affect SCFA levels include berberine, passiflora edulis, Chinese Yam, trametes versicolor extract, lotus seed resistant starch, xylooligosaccharides from corn cobs, coptis chinensis, Reishi mushroom, Poria mushroom, Lingzhi mushroom, Daikenchuto. Sleep, diet, exercise and stress management needs to be evaluated. Be cautious with use of antibiotics.
ß-glucuronidase	1124 U/mL	≤2300	1088 U/mL	

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Other Markers

MARKER	RESULT			COMMENT
	CURRENT	REF RANGE	PREV	
sIgA	>1000.0 mcg/g	≤857.0	>1000.0 mcg/g	Elevated levels are indicative of immune upregulation in the gut. Causes could be due to food sensitivities, intestinal permeability or infections. Consider testing at peptide and protein levels for food sensitivities for higher sensitivity.
Fecal Occult Blood	8.2 mcg/g	≤10.0	8.2 mcg/g	
pH	7.0	6.1~7.8	7.0	
Fecal Zonulin	341.9 ng/mL	25.1~160.8	341.9 ng/mL	Elevation indicative of intestinal permeability. Addressing gut dysbiosis and low diversity if any. Checking for food sensitivities at peptide and protein level recommended.
Fecal Anti Gliadin	224.8 U/L	≤148.0	224.8 U/L	Fecal Anti Gliadin is a less sensitive marker of wheat sensitivity in comparison to serum antibodies to peptide fragments of wheat. Individuals can consider a wheat avoidance diet.

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Gut Microbiome and Intestinal Permeability

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Enterobacteriaceae⁻	6.6 ↔	≤20.0	10.9 ↔	★★★★	Intestinal permeability
Akkermansia muciniphila⁻	11.5 ↔	≥10.0	4.3 ↓	★★★★	
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★	Lower SCFA production
Propionibacterium	19.5 ↔	≥10.0	23.0 ↔	★★★	
Eubacterium	15.0 ↔	≥10.0	2.4 ↓	★★★	
Lactobacillus	12.9 ↔	≥10.0	22.3 ↔	★★★	
Roseburia	19.6 ↔	≥10.0	19.3 ↔	★★★	
Eubacterium rectale	28.0 ↔	≥10.0	4.4 ↓	★★★	Lower butyrate production
Butyrivibrio	3.4 ↓	≥10.0	0.4 ↓	★★★★	
Faecalibacterium prausnitzii	15.0 ↔	≥10.0	15.0 ↔	★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus reuteri	23.4 ↔	≥10.0	9.9 ↓		
Lactobacillus rhamnosus	14.8 ↔	≥10.0	21.5 ↔		
Lactobacillus plantarum	16.7 ↔	≥10.0	28.0 ↔		
Streptococcus thermophilus	22.5 ↔	≥10.0	6.3 ↓		
Lactobacillus bulgaricus	17.6 ↔	≥10.0	16.8 ↔		
Lactobacillus acidophilus	11.5 ↔	≥10.0	29.5 ↔		
Bifidobacterium longum	21.0 ↔	≥10.0	29.8 ↔		

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Gut Microbiome and SIBO

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Streptococcus species	27.6 ↑	≤20.0	22.6 ↑	★★★	SIBO syndrome
Escherichia coli¯	3.1 ↔	≤20.0	8.3 ↔	★★★	
Staphylococcus species	15.2 ↔	≤20.0	30.0 ↑	★★★	
Micrococcus	15.5 ↔	≤20.0	20.8 ↑	★★★	
Acinetobacter¯	19.5 ↔	≤20.0	4.2 ↔	★★★	
Bacteroides¯	5.2 ↔	≤20.0	19.9 ↔	★★★	
Clostridium	16.3 ↔	≤20.0	19.7 ↔	★★★	
Peptostreptococcus	3.9 ↔	≤20.0	3.5 ↔	★★★	
Enterococcus species	20.7 ↑	≤20.0	2.8 ↔	★★★	
Methanobrevibacter smithii	14.9 ↔	≤20.0	0.6 ↔	★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus casei	24.5 ↔	≥10.0	23.8 ↔		
Lactobacillus plantarum	16.7 ↔	≥10.0	28.0 ↔		

Based on clinical literature, the following probiotics and supplements maybe beneficial

Supplements: Berberine, Origanum vulgare, Wormwood oil, Lemon balm oil, Barberry root extract.

Consider these supplements in relation to medical history and symptoms. Not all recommended supplements are appropriate in all individual cases. Consult a knowledgeable healthcare provider before taking any supplemental nutrients or probiotics.

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Gut Microbiome and Cardiovascular Health

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Collinsella	18.0 ↔	≤20.0	13.0 ↔	★★★★	Atherosclerosis
Lactobacillus ruminis	14.0 ↔	≤20.0	4.6 ↔	★★★★	Stroke
Atopobium	26.1 ↑	≤20.0	16.7 ↔	★★★★	
Lactobacillus sakei	26.5 ↔	≥10.0	16.7 ↔	★★★★	
Escherichia coli¯	3.1 ↔	≤20.0	8.3 ↔	★★★★★	Cardiovascular disease
Enterobacter aerogenes¯	11.0 ↔	≤20.0	1.8 ↔	★★★★★	
Streptococcus species	27.6 ↑	≤20.0	22.6 ↑	★★★★★	
Solobacterium moorei	2.1 ↔	≤20.0	7.1 ↔	★★★★★	
Atopobium parvulum	0.4 ↔	≤20.0	19.7 ↔	★★★★★	
Roseburia intestinalis	6.4 ↓	≥10.0	26.1 ↔	★★★★★	
Faecalibacterium prausnitzii	17.5 ↔	≥10.0	26.5 ↔	★★★★★	
Prevotella copri¯	17.1 ↔	≥10.0	15.3 ↔	★★★★★	
Alloprevotella¯	25.3 ↔	≥10.0	16.6 ↔	★★★★★	
Catenibacterium	16.7 ↔	≥10.0	22.6 ↔	★★★★★	
Tyzzerella	15.6 ↔	≤20.0	15.5 ↔	★★★★★	
Tyzzerella 4	4.1 ↔	≤20.0	7.6 ↔	★★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus plantarum	16.7 ↔	≥10.0	28.0 ↔		
Streptococcus thermophilus	22.5 ↔	≥10.0	6.3 ↓		

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Gut Bacteria and Autoimmune Health

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Porphyromonas gingivalis¯	5.0 ↔	≤20.0	4.4 ↔	★★★	Rheumatoid arthritis
Lactobacillus	12.9 ↔	≥10.0	22.3 ↔	★★★★	Celiac disease
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★★	
Enterobacteriaceae¯	6.6 ↔	≤20.0	10.9 ↔	★★★	
Staphylococcaceae	22.9 ↑	≤20.0	11.8 ↔	★★★	
Staphylococcus epidermidis	14.3 ↔	≤20.0	3.2 ↔	★★★	
Staphylococcus pasteuri	13.9 ↔	≤20.0	23.3 ↑	★★★	
Coprococcus	11.0 ↔	≥10.0	0.3 ↓	★★★	Psoriatic arthritis
Akkermansia muciniphila¯	10.8 ↔	≥10.0	5.0 ↓	★★★	
Pseudobutyrivibrio¯	21.4 ↔	≥10.0	10.5 ↔	★★★	
Proteus mirabilis¯	5.9 ↔	≤20.0	22.8 ↑	★★	Rheumatoid arthritis, Ankylosing spondylitis
Enterococcus gallinarum	18.7 ↔	≤20.0	24.1 ↑	★★★★★	Autoimmunity
Clostridia clusters XIVa	22.5 ↔	≥10.0	22.8 ↔	★★★★★	Inflammation, Allergy
Clostridia clusters IV	25.0 ↔	≥10.0	22.2 ↔	★★★★★	
Clostridia clusters XVIII	23.1 ↔	≥10.0	26.0 ↔	★★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus acidophilus	11.5 ↔	≥10.0	29.5 ↔		
Lactobacillus casei	24.5 ↔	≥10.0	23.8 ↔		
Bifidobacterium bifidum	12.7 ↔	≥10.0	29.2 ↔		

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Gut Microbiome and Metabolic Health

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Oscillospira¯	29.3 ↑	≤20.0	23.4 ↑	★★★★★	Low BMI, Metabolic health
Christensenella minuta	7.5 ↔	≤20.0	8.8 ↔	★★★★★	
Bacteroides caccae¯	13.0 ↔	≤20.0	1.6 ↔	★★★★★	Diabetes, Metabolic health
Clostridium hathewayi¯	29.2 ↑	≤20.0	3.6 ↔	★★★★★	
Clostridium ramosum	16.3 ↔	≤20.0	0.7 ↔	★★★★★	
Clostridium symbiosum¯	25.1 ↑	≤20.0	4.0 ↔	★★★★★	
Eggerthella lenta	5.9 ↔	≤20.0	7.0 ↔	★★★★★	
Escherichia coli¯	3.1 ↔	≤20.0	8.3 ↔	★★★★★	
Bifidobacterium animalis	10.3 ↔	≥10.0	7.7 ↓	★★★★	Obesity, Metabolic health
Blautia hydrogenotorophica	0.1 ↔	≤20.0	20.4 ↑	★★	
Ruminococcus obeum	14.1 ↔	≤20.0	11.0 ↔	★★	
Akkermansia muciniphila¯	11.5 ↔	≥10.0	4.3 ↓	★★★★★	Obesity, Diabetes, Metabolic health
Methanobrevibacter smithii	14.9 ↔	≤20.0	0.6 ↔	★★	IBS, Obesity, Metabolic health
Bifidobacterium adolescentis	15.7 ↔	≥10.0	29.5 ↔	★★★	Digestive insufficiency, Metabolic health
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus paracasei	6.8 ↓	≥10.0	6.8 ↓		
Lactobacillus rhamnosus	14.8 ↔	≥10.0	21.5 ↔		
Lactobacillus acidophilus	11.5 ↔	≥10.0	29.5 ↔		
Lactobacillus casei	24.5 ↔	≥10.0	23.8 ↔		
Bifidobacterium animalis	10.3 ↔	≥10.0	7.7 ↓		

Based on clinical literature, the following probiotics and supplements maybe beneficial

Probiotics: Lactobacillus paracasei.

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Gut Microbiome and Nutrition

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★★	Lower prodution of folate, Lower production of vitamin K, Lower production of riboflavin (vitamin B2), Lower production of cobalamin (vitamin B12)
Lactobacillus	12.9 ↔	≥10.0	22.3 ↔	★★★★	
Bacillus subtilis	27.4 ↔	≥10.0	15.3 ↔	★★★★	
Propionibacterium freudenreichii	5.0 ↓	≥10.0	22.5 ↔	★★★★	
Bifidobacterium animalis subspecies lactis	24.5 ↔	≥10.0	27.4 ↔	★★	Oxalate degradation affected
Lactobacillus animalis	13.2 ↔	≥10.0	10.4 ↔	★★	
Ruminococcus bromii	25.7 ↔	≥10.0	28.1 ↔	★★★★	Digestive insufficiency
Eubacterium rectale	28.0 ↔	≥10.0	4.4 ↓	★★★★	
Roseburia	19.6 ↔	≥10.0	19.3 ↔	★★★★	Lower butyrate production
Eubacterium rectale	28.0 ↔	≥10.0	4.4 ↓	★★★★	
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus animalis	13.2 ↔	≥10.0	10.4 ↔		
Bifidobacterium animalis	10.3 ↔	≥10.0	7.7 ↓		

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Gut Microbiome and Neurological Health

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Lactobacillaceae	17.8 ↔	≤20.0	29.6 ↑	★★★★	Parkinson's disease
Bradyrhizobiaceae⁻	9.5 ↔	≤20.0	8.5 ↔	★★★★	
Clotridiales Incertae Sedis IV	27.4 ↑	≤20.0	24.6 ↑	★★★★	
Enterobacteriaceae⁻	6.6 ↔	≤20.0	10.9 ↔	★★★★	
Desulfovibrio⁻	22.2 ↑	≤20.0	28.6 ↑	★★★★	Autism
Bacteroides vulgatus⁻	26.7 ↑	≤20.0	16.9 ↔	★★★★	
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★★	
Prevotella⁻	6.9 ↓	≥10.0	20.4 ↔	★★★★	
Coprococcus	11.0 ↔	≥10.0	0.3 ↓	★★★★	
Veillonellaceae⁻	23.2 ↔	≥10.0	22.6 ↔	★★★★	
Bacteroidales⁻	3.3 ↔	≤20.0	10.3 ↔	★★★	Depression
Lachnospiraceae	28.0 ↔	≥10.0	10.5 ↔	★★★	
Methanobrevibacter	22.6 ↑	≤20.0	14.9 ↔	★★★	Multiple sclerosis
Butyricimonas⁻	18.8 ↔	≥10.0	29.4 ↔	★★★	
Pseudomonas	9.6 ↔	≤20.0	9.6 ↔	★★★	
Mycoplana⁻	8.0 ↔	≤20.0	3.5 ↔	★★★	
Haemophilus⁻	6.4 ↔	≤20.0	4.7 ↔	★★★	
Blautia	16.3 ↔	≤20.0	13.3 ↔	★★★	
Dorea	11.7 ↔	≤20.0	5.0 ↔	★★★	
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★	Alzheimer's disease.
Bacteroides⁻	5.2 ↔	≤20.0	19.9 ↔	★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus acidophilus	11.5 ↔	≥10.0	29.5 ↔		
Lactobacillus casei	24.5 ↔	≥10.0	23.8 ↔		
Lactobacillus fermentum	29.9 ↔	≥10.0	17.6 ↔		

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Bifidobacterium bifidum	12.7 ↔	≥10.0	29.2 ↔
Lactobacillus brevis	11.8 ↔	≥10.0	22.5 ↔
Bifidobacterium dentium	22.6 ↔	≥10.0	24.8 ↔
Streptococcus thermophilus	22.5 ↔	≥10.0	6.3 ↓
Lactobacillus bulgaricus	17.6 ↔	≥10.0	16.8 ↔
Streptococcus	25.8 ↔	≥10.0	13.7 ↔

Based on clinical literature, the following probiotics and supplements maybe beneficial

Supplements: glycine, Pantothenic Acid, riboflavin, vitamin B6, folate, vitamin B12, betaine.

Consider these supplements in relation to medical history and symptoms. Not all recommended supplements are appropriate in all individual cases. Consult a knowledgeable healthcare provider before taking any supplemental nutrients or probiotics.

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Gut Microbiome and Liver Health

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Lactococcus	14.6 ↔	≥10.0	25.2 ↔	★★	Alcohol-associated dysbiosis
Pediococcus	27.7 ↔	≥10.0	14.6 ↔	★★	
Lactobacillus	12.9 ↔	≥10.0	22.3 ↔	★★	
Leuconostoc	1.1 ↓	≥10.0	14.2 ↔	★★	
Veillonella⁻	4.8 ↔	≤20.0	9.9 ↔	★★★★★	Liver cirrhosis
Streptococcus species	27.6 ↑	≤20.0	22.6 ↑	★★★★★	
Clostridium	16.3 ↔	≤20.0	19.7 ↔	★★★★★	
Lachnospiraceae	28.0 ↔	≥10.0	10.5 ↔	★★★	Alcohol-related liver cirrhosis
Ruminococcaceae	14.7 ↔	≥10.0	0.2 ↓	★★★	
Clostridiales Family XIV Incertae Sedis	12.2 ↔	≥10.0	15.1 ↔	★★★	
Enterobacteriaceae⁻	6.6 ↔	≤20.0	10.9 ↔	★★★	
Escherichia coli⁻	3.1 ↔	≤20.0	8.3 ↔	★★★	
Streptococci	14.2 ↔	≤20.0	6.2 ↔	★★★	Alcoholic hepatitis
Enterobacteria⁻	9.5 ↔	≤20.0	28.2 ↑	★★★	
Faecalibacterium prausnitzii	17.5 ↔	≥10.0	26.5 ↔	★★★	
Ruminococcus	17.6 ↔	≤20.0	5.1 ↔	★★★★	Nonalcoholic steatohepatitis
Prevotella⁻	6.9 ↓	≥10.0	20.4 ↔	★★★★	
Enterococcus	2.6 ↔	≤20.0	12.1 ↔	★★★★	Primary sclerosing cholangitis
Fusobacterium⁻	2.3 ↔	≤20.0	7.4 ↔	★★★★	
Streptococcus species	27.6 ↑	≤20.0	22.6 ↑	★★★★	
Veillonella⁻	4.8 ↔	≤20.0	9.9 ↔	★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Lactobacillus rhamnosus GG	29.1 ↔	≥10.0	10.2 ↔		
Lactobacillus	12.9 ↔	≥10.0	22.3 ↔		
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔		

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Gut Microbiome and IBD

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Roseburia	19.6 ↔	≥10.0	19.3 ↔	★★★★★	IBD
Phascolarctobacterim⁻	17.1 ↔	≤20.0	0.3 ↔	★★★★★	
Clostridium	16.3 ↔	≤20.0	19.7 ↔	★★★★★	
Ruminococcaceae	14.7 ↔	≥10.0	0.2 ↓	★★★★★	
Faecalibacterium	12.8 ↔	≥10.0	17.8 ↔	★★★★★	
Desulfovibrio piger⁻	20.5 ↑	≤20.0	18.4 ↔	★★★★★	
Faecalibacterium prausnitzii	17.5 ↔	≥10.0	26.5 ↔	★★★	
Akkermansia muciniphila⁻	11.5 ↔	≥10.0	4.3 ↓	★★★	Crohn's disease
Dialister invisus⁻	17.8 ↔	≥10.0	29.2 ↔	★★★★	
Faecalibacterium prausnitzii	17.5 ↔	≥10.0	26.5 ↔	★★★★	
Bifidobacterium adolescentis	15.7 ↔	≥10.0	29.5 ↔	★★★★	
Ruminococcus gnavus	2.0 ↔	≤20.0	4.2 ↔	★★★★	
Enterococcus	2.6 ↔	≤20.0	12.1 ↔	★★	
Veillonella⁻	4.8 ↔	≤20.0	9.9 ↔	★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Saccharomyces boulardii	8.6 ↓	≥10.0	16.6 ↔		
Lactobacillus reuteri	23.4 ↔	≥10.0	9.9 ↓		
Lactobacillus plantarum	16.7 ↔	≥10.0	28.0 ↔		
Lactobacillus salivarius	4.6 ↓	≥10.0	22.6 ↔		
Bifidobacterium breve	27.2 ↔	≥10.0	16.8 ↔		
Bifidobacterium bifidum	12.7 ↔	≥10.0	29.2 ↔		
Lactobacillus acidophilus	11.5 ↔	≥10.0	29.5 ↔		
Escherichia coli Nissle⁻	8.8 ↓	≥10.0	6.1 ↓		

Based on clinical literature, the following probiotics and supplements maybe beneficial

Probiotics: Saccharomyces boulardii, Lactobacillus salivarius, Escherichia coli Nissle.

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Consider these supplements in relation to medical history and symptoms. Not all recommended supplements are appropriate in all individual cases. Consult a knowledgeable healthcare provider before taking any supplemental nutrients or probiotics.

Gut Microbiome and IBS

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
Dorea	11.7 ↔	≤20.0	5.0 ↔	★★★★★	IBS
Ruminococcus	17.6 ↔	≤20.0	5.1 ↔	★★★★★	
Clostridium	16.3 ↔	≤20.0	19.7 ↔	★★★★★	
Lactobacillus	12.9 ↔	≥10.0	22.3 ↔	★★★★★	
Veillonella⁻	4.8 ↔	≤20.0	9.9 ↔	★★★★★	
Bifidobacterium catenulatum	11.2 ↔	≥10.0	20.2 ↔	★★★★★	
Bifidobacterium	29.4 ↔	≥10.0	21.3 ↔	★★★	
Enterobacteriaceae⁻	6.6 ↔	≤20.0	10.9 ↔	★★★	
Roseburia	19.6 ↔	≥10.0	19.3 ↔	★★★★	Lower butyrate production
Eubacterium rectale	28.0 ↔	≥10.0	4.4 ↓	★★★★	
YOUR LEVELS OF PROBIOTIC ORGANISMS					
Bacillus coagulans	12.2 ↔	≥10.0	25.2 ↔		
Bifidobacterium infantis	2.5 ↓	≥10.0	15.6 ↔		
Lactobacillus acidophilus	11.5 ↔	≥10.0	29.5 ↔		
Lactobacillus plantarum	16.7 ↔	≥10.0	28.0 ↔		
Lactobacillus rhamnosus	14.8 ↔	≥10.0	21.5 ↔		
Bifidobacterium breve	27.2 ↔	≥10.0	16.8 ↔		
Bifidobacterium lactis	28.7 ↔	≥10.0	18.1 ↔		
Bifidobacterium longum	21.0 ↔	≥10.0	29.8 ↔		
Streptococcus thermophilus	22.5 ↔	≥10.0	6.3 ↓		

Based on clinical literature, the following probiotics and supplements maybe beneficial

Probiotics: Bifidobacterium infantis.

Consider these supplements in relation to medical history and symptoms. Not all recommended supplements are appropriate in all individual cases. Consult a knowledgeable healthcare provider before taking any supplemental nutrients or probiotics.

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Gut Microbiome and Hormones

GENUS/SPECIES	RELATIVE ABUNDANCE			RATING	POTENTIAL ASSOCIATED RISK*
	CURRENT	REF RANGE	PREVIOUS 06/24/2020		
ß-glucuronidase producing bacteria	9.5 ↔	≤20.0	17.7 ↔	★★★★	Estrogen metabolism affected
ß-galactosidase producing bacteria	10.0 ↔	≤20.0	2.8 ↔	★★★★	

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GUT PATHOGENS

Bacteria

✓Detected --- Not Detected

GENUS/SPECIES	CURRENT RESULT	RESULT	REF RANGE	PREVIOUS RESULT 06/24/2020	RESULT
Clostridium difficile Toxin A	2.5e5	✓	≤1e3	1e6	✓
Clostridium difficile Toxin B	<1e3	—	≤1e3	<1e3	—
Campylobacter spp	<1e2	—	≤1e2	<1e2	—
Campylobacter jejuni	<1e2	—	≤1e2	<1e2	—
Campylobacter coli	<1e2	—	≤1e2	<1e2	—
Campylobacter upsaliensis	<1e2	—	≤1e2	<1e2	—
Plesiomonas shigelloides	7.5e4	✓	≤3e2	3.5e7	✓
Vibrio (parahaemolyticus)	<3e3	—	≤3e3	<3e3	—
Enteropathogenic E.coli (EPEC)	<1.5e3	—	≤1.5e3	<1.5e3	—
Enterotoxigenic E.coli (ETEC) Lt/St	<2e3	—	≤2e3	<2e3	—
E.coli O157	<1e2	—	≤1e2	1e5	✓
Shiga-Like Toxin Producing E.coli (STEC) Stx1/Stx2	<1e2	—	≤1e2	<1e2	—
Shigella/EIEC	<1e2	—	≤1e2	<1e2	—
Helicobacter pylori	<1.5e4	—	≤1.5e4	<1.5e4	—
Listeria	<3e3	—	≤3e3	<3e3	—
Vibrio (cholerae)	<2e2	—	≤2e2	<2e2	—
Enteroaggregative E.coli (EAEC)	<1e2	—	≤1e2	<1e2	—
Klebsiella pneumoniae	<3.5e3	—	≤3.5e3	<3.5e3	—
Edwardsiella tarda	<4.5e3	—	≤4.5e3	<4.5e3	—
Yersinia enterocolitica	<2e4	—	≤2e4	<2e4	—
Vibrio (vulnificus)	<1e4	—	≤1e4	<1e4	—
Salmonella	<2e3	—	≤2e3	<2e3	—

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Parasites - Protozoans

✓Detected --- Not Detected

GENUS/SPECIES	CURRENT RESULT	RESULT	REF RANGE	PREVIOUS RESULT 06/24/2020	RESULT
Cryptosporidium	<1e2	—	≤1e2	<1e2	—
Entamoeba histolytica	<1e2	—	≤1e2	<1e2	—
Giardia lamblia	<4e2	—	≤4e2	<4e2	—
Cyclospora cayetanensis	<2e3	—	≤2e3	<2e3	—
Chilomastix mesnili	<2e3	—	≤2e3	<2e3	—
Cyclospora spp.	<2.5e3	—	≤2.5e3	<2.5e3	—
Dientamoeba fragilis	<1e3	—	≤1e3	<1e3	—
Endolimax nana	<2e3	—	≤2e3	<2e3	—
Entamoeba coli	<2e3	—	≤2e3	<2e3	—
Pentatrichomonas hominis	<1e3	—	≤1e3	<1e3	—
Isospora belli	<1e3	—	≤1e3	<1e3	—
Blastocystis hominis	<1e3	—	≤1e3	<1e3	—
Trichomonas hominis	<1e3	—	≤1e3	<1e3	—

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Parasites - Helminths

✓Detected --- Not Detected

GENUS/SPECIES	CURRENT RESULT	PREVIOUS RESULT 06/24/2020
Strongyloides stercoralis	—	—
Taenia solium	—	—
Schistosoma	—	—
Fasciola/Fasciolopsis	—	—
Hymenolepis	—	—
Dipylidium caninum	—	—
Diphyllobothrium latum	—	—
Enterobius vermicularis	—	—
Mansonella	—	—
Ancylostoma duodenale	—	—
Ascaris lumbricoides	—	—
Necator americanus	—	—
Trichuris trichiura	—	—
Taenia spp.	—	—
Larval Nematode	—	—

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Virus

✓Detected --- Not Detected

GENUS/SPECIES	CURRENT RESULT	RESULT	REF RANGE	PREVIOUS RESULT 06/24/2020	RESULT
Adenovirus F40/41	<1e2	—	≤1e2	<1e2	—
Rotavirus A	<3.1e2	—	≤3.1e2	<3.1e2	—
Astrovirus	<1.2e3	—	≤1.2e3	<1.2e3	—
Norovirus GI	<1e3	—	≤1e3	<1e3	—
Norovirus GII	<1e3	—	≤1e3	<1e3	—
Sapovirus I	<2.1e2	—	≤2.1e2	<2.1e2	—
Sapovirus II	<2.1e2	—	≤2.1e2	<2.1e2	—
Sapovirus V	<2.1e2	—	≤2.1e2	<2.1e2	—
Sapovirus IV	<2.1e2	—	≤2.1e2	<2.1e2	—
Cytomegalovirus	<1e3	—	≤1e3	<1e3	—
Epstein Barr virus	<1e3	—	≤1e3	<1e3	—

Fungi

✓Detected --- Not Detected

GENUS/SPECIES	CURRENT RESULT	RESULT	REF RANGE	PREVIOUS RESULT 06/24/2020	RESULT
Candida albicans	<1.1e2	—	≤1e2	<1.1e2	—
Candida spp.	<1.1e2	—	≤1e2	<1.1e2	—
Geotrichum spp.	<1.1e2	—	≤1e2	<1.1e2	—
Microsporidium spp.	<1.1e2	—	≤1e2	<1.1e2	—
Rodotorula spp.	<2.5e3	—	≤2.5e3	<2.5e3	—

Antibiotic Resistance Genes

✓Detected --- Not Detected

GENUS/SPECIES	CURRENT RESULT	PREVIOUS RESULT
Helicobacter - Clarithromycin	✓	✓
Helicobacter - Fluoroquinolones	—	—
Universal Microbiota Resistance Genes - b-lactamase	—	—
Universal Microbiota Resistance Genes - Fluoroquinolones	—	—
Universal Microbiota Resistance Genes - Macrolides	—	—
Universal Microbiota Resistance Genes - Vancomycin	—	—

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INFLAMMATION MARKERS

CALPROTECTIN	CURRENT	REF RANGE	PREVIOUS
Calprotectin, a member of the S100 calcium- and zinc-binding protein family, is a protein released by a type of white blood cell called neutrophil. When there is inflammation in the gastrointestinal tract, neutrophils move to the area and release calprotectin, resulting in an increased level in the stool. The amount of calprotectin reflects the number of participating neutrophils in this inflammation. Calprotectin is most frequently used as part of the diagnostic evaluation of patients with suspected inflammatory bowel disease (IBD). For the individuals already diagnosed with IBD, it can be used to monitor the level of inflammation.	424.4 mcg/g	≤50.0	417.7 mcg/g
FECAL LACTOFERRIN			
Lactoferrin is a glycoprotein released by a type of white blood cell called neutrophil. Fecal lactoferrin is a biomarker of serious gastrointestinal inflammation. Gastrointestinal inflammation is associated with increased infiltration of activated neutrophils into the mucosa and increased release of lactoferrin into the gut. Clinical studies have shown that fecal lactoferrin levels of healthy persons are similar to irritable bowel syndrome (IBS) patients, but markedly increased in patients with active inflammatory bowel disease (IBD). Fecal lactoferrin levels are helpful in monitoring disease activity and efficacy of treatment for IBD.	13.9 mcg/ml	≤6.4	13.9 mcg/ml
BETA DEFENSIN 2			
Beta-defensin 2 is an antibiotic peptide locally regulated by inflammation in humans. It is produced by a number of epithelial cells and exhibits potent antimicrobial activity against Gram-negative bacteria and Candida, but not Gram-positive bacteria. It has been speculated that beta-defensin 2 may contribute to the infrequency of Gram-negative infections on skin and lung tissue.	62.2 ng/mL	≤34.9	62.2 ng/mL
LYSOZYME			
Fecal lysozyme concentration is a excellent parameter to gauge inflammatory activity in IBD patients. Patients with IBS have been shown to have similar levels in comparison to healthy controls but this marker is highly elevated in IBD patients.	126.6 ng/mL	≤575.0	126.6 ng/mL
S100A12			
Fecal S100A12 is a novel noninvasive marker that has been shown to distinguish active IBD from healthy control subjects in certain populations. S100A12 levels were evenly distributed throughout fecal samples and were stable for 7 days when stored at room temperature. Fecal S100A12 was shown to be elevated in children with IBD compared with healthy control subjects, with levels closely correlated to disease activity and other serum inflammatory markers, particularly lower gut involvement.	26.5 mcg/ml	≤50.0	26.5 mcg/ml
MMP 9			
MMP-9 is an important marker of intestinal inflammation. It has been shown to be significantly increased in the stool of UC patients compared with healthy controls and patients with IBS, and was found to correlate with the clinical and endoscopic activity of UC.	0.7 ng/mL	≤0.2	0.7 ng/mL
FECAL EOSINOPHIL PROTEIN X			
Eosinophil Protein X (EPX) is a water-soluble protein that is found in eosinophils. EPX levels in stool are a marker of eosinophil activity in the gastrointestinal system. Fecal EPX abnormality is suggestive of food allergy, eosinophil-driven inflammation (caused by parasites). The test has been shown to have higher specificity and positive predictive value for detecting disease activity in inflammatory bowel disease compared to fecal calprotectin.	2.2 mcg/g	≤4.8	2.2 mcg/g

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DIGESTIVE INSUFFICIENCY AND MALABSORPTION MARKERS

PANCREATIC ELASTASE 1	CURRENT	REF RANGE	PREVIOUS
Pancreatic Elastase is an enzyme produced by exocrine tissue in the pancreas. Fecal pancreatic elastase is a non-invasive marker of exocrine pancreatic function. In the digestive tract, elastase is not broken down by other enzymes and is eventually eliminated from the body in the stool. Elastase can be detected and measured in the stool when a person's pancreas is functioning normally. The level in the stool is decreased when the exocrine tissues of the pancreas are not producing sufficient elastase and other digestive enzymes.	190.6 mcg/g	≥200.0	153.5 mcg/g
MEAT FIBER			
Presence of meat fibers is indicative of improper chewing or digestive insufficiency.	DETECTED		NOT DETECTED
VEGETABLE FIBER			
Presence of vegetable fibers is indicative of improper chewing or digestive insufficiency.	NOT DETECTED		DETECTED
FAT MALABSORPTION			
TOTAL FECAL FAT			
This test measures the amount of fat in a stool sample. Excess fecal fat (termed steatorrhea) in stool is indicative of malabsorption disorder. The absorption of fat can be varied by production of bile in the gallbladder or liver, production of digestive enzymes in the pancreas, and normal functioning of the intestines. Decreased absorption of fat can be a sign of many different illnesses, including celiac disease, crohn's disease, cystic fibrosis, pancreatitis, etc.	24.7 mg/g	2.9~37.5	24.7 mg/g
TOTAL FECAL TRIGLYCERIDES			
Total triglyceride subfraction	6.1 mg/g	0.3~2.5	6.1 mg/g
LONG CHAIN FATTY ACIDS			
Total long chain fatty acids	11.8 mg/g	0.9~28.1	11.8 mg/g
TOTAL CHOLESTEROL			
Total Cholestrol subfraction	2.3 mg/g	0.5~5.3	2.3 mg/g
TOTAL PHOSPHOLIPIDS			
Total Phospholipid subfraction	1.6 mg/g	0.3~6.4	1.6 mg/g

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GUT METABOLITES

BILE ACID METABOLITES

Bile Acids are natural products of cholesterol synthesis that aid in the emulsification and absorption of dietary fats in the small intestine. Elevated total fecal bile acid is indicative of a diagnosis of bile acid malabsorption. Quantification of fecal bile acids aids in diagnosis for IBS and identification of patients with chronic diarrhea who may benefit from bile acid sequestrant therapy. There is a connection between the liver health, fecal bile acid concentrations, and gut microbiota composition. Bile acids have both direct antimicrobial effects on gut microbes and indirect effects through FXR-induced antimicrobial peptides. Cholic acid (CA), Chenodeoxycholic acid (CDCA), Deoxycholic acid (DCA), Lithocholic acid (LCA) are the major bile acids related to gut microbiome.

CHOLIC ACID (CA)	CURRENT	REF RANGE	PREVIOUS
Cholic acid (CA) is synthesized in the liver from cholesterol. It undergoes enterohepatic circulation, in which its principal functions include induction of bile flow; feedback inhibition of bile acid synthesis; modulation of cholesterol synthesis; elimination of cholesterol; and the facilitation of dispersion and absorption of lipids and fat-soluble vitamins through the formation of micelles.	0.25 %	≤0.36	0.28 %
CHENODEOXYCHOLIC ACID (CDCA)			
Chenodeoxycholic acid (CDCA), also known as chenodiol, usually conjugates with either glycine or taurine. It acts as a detergent to solubilize fats for intestinal absorption and is reabsorbed by the small intestine. It is used as cholagogue, a choleretic laxative, and to prevent or dissolve gallstones.	0.31 %	≤1.25	1.24 %
DEOXYCHOLIC ACID (DCA)			
Deoxycholic acid (DCA) is a bile acid which emulsifies and solubilizes dietary fats in the intestine, and when injected subcutaneously, it disrupts cell membranes in adipocytes and destroys fat cells in that tissue.	32.90 %	24.25~75.84	19.93 %
LITHOCHOLIC ACID (LCA)			
Lithocholic acid (LCA) is a bile acid formed from chenodeoxycholate by bacterial action, usually conjugated with glycine or taurine. It acts as a detergent to solubilize fats for absorption and is itself absorbed. It is used as cholagogue and choleretic. Chronically high levels of lithocholic acid are associated with several forms of cancer including colon cancer, pancreatic cancer, esophageal cancer, and many other GI cancers. High bile acid levels lead to the generation of reactive oxygen species and reactive nitrogen species, disruption of the cell membrane and mitochondria, induction of DNA damage, mutation and apoptosis, and the development of reduced apoptosis capability upon chronic exposure.	56.94 %	24.16~75.75	69.62 %
LCA/DCA RATIO			
LCA and DCA are secondary bile acids formed from CDCA and CA in the colon. The ratio when high or low has been found useful to check risk for several conditions such as colorectal cancer and gall stones.	1.73	0.32~3.38	3.49

SHORT CHAIN FATTY ACIDS

ACETATE			
Acetic Acid can inhibit the accumulation of body fat and hepatic lipids without altering food consumption. It suppresses body fat accumulation by upregulating genes necessary for fatty-acid oxidation and mitochondrial processing. It has been found to have an inhibitory effect on the conversion of glucose to fatty acids in the liver. It has also been suggested as a promising compound for improving obesity and obesity-linked type 2 diabetes.	68.2 %	60.2~72.7	62.0 %
BUTYRATE			
Butyric Acid has been shown to enhance adaptive thermogenesis and fatty acid oxidation (burning of fat). It has also been shown to improve mitochondrial function, increase insulin sensitivity, and reduce fat production. Butyrate may assist treating and preventing diet induced insulin resistance by promoting energy production and enhancing mitochondrial function.	9.8 %	5.1~12.4	2.3 %
PROPIONATE			

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Propionic Acid is present in the gastro-intestinal tract of humans and other mammals as an end-product of the microbial digestion of carbohydrates. It is also an antifungal agent contained in many food preservatives. Absorbed propionic acid into the blood circulation may cross the blood brain barrier and enter the brain. Propionic aciduria is a disease that comprises many various disorders. The outcome of patients born with Propionic aciduria (genetic disorder) is poor intellectual development patterns, with significant neurological and various visceral complications.	17.1 %	15.4~30.3	28.8 %
VALERATE			
Valeric Acid, or pentanoic acid, is formed in small amounts during fermentation of dietary fibre, is important in cholesterol metabolism. The structure of valeric acid is very similar to that of the inhibitory neurotransmitter γ-aminobutyric acid (GABA), except for the terminal amino group. Valeric acid is similar to its analogue, valproic acid, which has been shown to increase the production of GABA, resulting in a decreased synthesis of succinic acid. Succinic acid is an inflammatory signaling molecule that is elevated in animals subjected to metabolic and inflammatory diseases and in high-fat diets the levels of succinic acid are increased at the expense of butyric acid. Valeric acid has also been associated with irritable bowel syndrome, ulcerative colitis, Crohn's disease, colorectal cancer, celiac disease, and autism.	0.5 %	0.8~3.5	2.8 %
TOTAL SHORT CHAIN FATTY ACIDS			
Short Chain Fatty Acids (SCFA) are the products of fermentation of insoluble fiber from diet (e.g., cellulose, resistant starch) by the bacteria in the gut. These fatty acids have been shown to play an important role in regulating metabolism in the gut and are closely associated with gastrointestinal diseases. Acetic acid, propionic acid, and butyric acid are the most abundant, representing 90-95% of the SCFA present in the colon. A total of 13 SCFAs are quantified in stool to assist assessment of the gut health and inflammation.	10.2 micromol/g	45.4~210.1	98.1 micromol/g
ß-GLUCURONIDASE			
Beta-glucuronidase is an enzyme induced by anaerobic bacteria. Many toxins, hormones, and drugs are excreted from the body after conjugation to a glucuronide molecule. Beta-glucuronidase can uncouple these conjugates, freeing these potential carcinogens in the bowel and increase cancer risk.	1124 U/mL	≤2300	1088 U/mL

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OTHER MARKERS

SIGA	CURRENT	REF RANGE	PREVIOUS
Secretory IgA is the primary antibody that is protecting us from pathogens and toxins from penetrating mucosal surfaces. Its role is crucial in protecting the integrity of the intestinal epithelium. The antibody blocks the access to the epithelial receptors and traps pathogens and toxins in the mucus which are then excreated by peristaltic movements. SIgA has been identified to potentially neutralize virulence factors, modulate intestinal microbiota by Fab-dependent and -independent mechanisms, promote dendritic cell (DC) recruitement across the epithelial barrier and also down-regulate pro-inflammatory responses normally associated with the uptake of highly pathogenic bacteria and potentially allergenic antigens. Multiple cytokines, including IL-4, TGF-β, IL-5, IL-6, IL-10 are instrumental in intestinal stimulating SIgA production. A subset of these cytokines, notably TGF-β and IL-10, are also required for maintaining mucosal tolerance, thus establishing one of the many links between SIgA production, immunity and intestinal homeostasis.	>1000.0 mcg/g	≤857.0	>1000.0 mcg/g
FECAL OCCULT BLOOD			
Fecal occult blood testing (FOBT) checks stool samples for hidden (occult) blood loss from the mouth to the colon. A positive result indicates either upper gastrointestinal bleeding or lower gastrointestinal bleeding. The test does not directly detect colon cancer but is often used in clinical screening for that disease. It can also be used in early diagnosis of active occult blood loss in anemia or other gastrointestinal symptoms.	8.2 mcg/g	≤10.0	8.2 mcg/g
PH			
Fecal pH tests for acidity or alkalinity of stool samples. An acidic stool is suggestive of a digestive problem such as lactose intolerance, a pathogen such as E. coli or rotavirus, or overgrowth of the acid producing bacteria (such as lactic acid bacteria). A high alkaline pH rating is associated with the body's inability to create enough acid along with undigested food.	7.0	6.1~7.8	7.0
FECAL ZONULIN			
Fecal zonulin measurement may be advantageous, compared to serum zonulin when assessing intestinal permeability, as serum zonulin may constitute secretion not only from intestinal cells, but also from extraintestinal tissues such as the liver, heart and brain. Stool may therefore present a more appropriate specimen for analyzing only intestinal production of zonulin. Elevated fecal levels of zonulin have been associated with metabolic syndrome, obesity, and healthy cigarette smokers. High fecal zonulin levels in smokers irrespective of IBD point to the significant and undesirable up-regulation of gut permeability in cigarette smokers.	341.9 ng/mL	25.1~160.8	341.9 ng/mL
FECAL ANTI GLIADIN			
Fecal anti-gliadin antibody tests for immune system reaction, IgA and IgG, to gluten in the diet. It enables direct and quantitative assessment of gluten exposure early after ingestion and could aid in the diagnosis and clinical management of nonresponsive CD and refractory CD.	224.8 U/L	≤148.0	224.8 U/L

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Risk and Limitations

Gut Zoomer testing is performed at Vibrant Genomics, a CLIA and CAP certified laboratory. However, laboratory error can occur, which might lead to incorrect results. Some of them may include sample or DNA mislabeling or contamination, operational error or failure to obtain data for certain genes. Vibrant's laboratory may need a second sample to complete the testing.

Vibrant Genomics has effective procedures in place to protect against technical and operational problems. However, such problems may still occur and examples include failure to obtain the Gut Zoomer abundance result for a specific species due to circumstances beyond Vibrant's control. Vibrant may re-test a sample in order to obtain these results but upon re-testing the results may still not be obtained. As with all medical laboratory testing, there is a small chance that the laboratory could report incorrect Gut Zoomer abundance results. A tested individual may wish to pursue further testing to verify any results.

Tested individuals should not change their diet, physical activity, or any medical treatments they are currently using based on the results without consulting their personal health care provider. These risk factors for Gut Zoomer are based on selected peer-reviewed scientific research findings as listed under references.

Tested individuals may find their experience is not consistent with Vibrant's selected peer reviewed scientific research findings of relative improvement for study groups. The science in this area is still developing and many personal health factors affect diet and health. Since subjects in the scientific studies referenced in this report may have had personal health and other factors different from those of tested individuals, results from these studies may not be representative of the results experienced by tested individuals. Further, some recommendations may or may not be attainable, depending on the tested individuals' physical ability or other personal health factors.

A limitation of this testing is that most scientific studies have been performed in Caucasian populations only. The interpretations and recommendations are done in the context of Caucasian studies, but the results may or may not be relevant to tested individuals of different or mixed ethnicities. Please note that pediatric ranges have not been established for these tests. Interference studies have not been established for individuals on immunosuppressive drugs.

Based on test results and other medical knowledge of the tested individual, health care providers might consider additional independent testing, or consult another health care provider or genetic counselor.