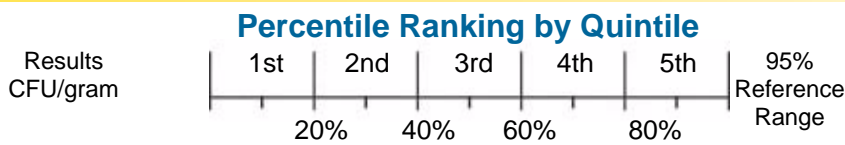


Metamatrix

3425 Corporate Way  
Duluth, GA 30096

## 2100 Gastrointestinal Function Profile

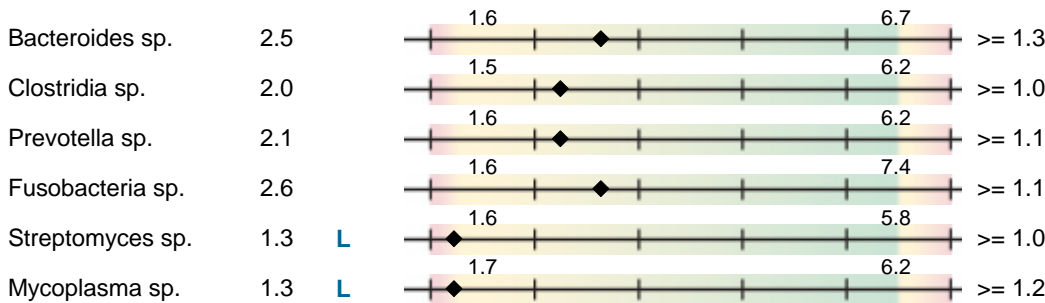
Methodology: DNA Analysis, GC/MS, Microscopic, Colorimetric, Automated Chemistry, ELISA



Consistency = Formed/Normal

### Predominant Bacteria (E+007) E+007

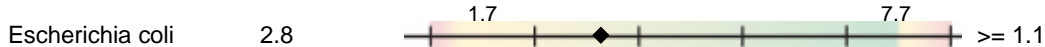
#### Obligate anaerobes



#### Facultative anaerobes



#### Obligate aerobes



### Opportunistic Bacteria

Klebsiella sp. 2.8E+008 H <=1.0E+005

#### Units and Reference Ranges

Organisms are detected by DNA analysis. One colony forming unit (CFU) is equivalent to one bacterium. Each genome detected represents one cell, or one CFU. Results are expressed in scientific notation, so an organism reported as 2.5 E7 CFU/gram is read as 25 million colony forming units per gram of feces. The cutoff for significance of Opportunistic Bacteria has been set at 1.0E+ 005 (100,000). These are levels above which clinically significant growth may be present. Rather than reporting semi-quantitative +1 to +4 levels, the new methodology provides full quantitative analysis.

**Predominant Bacteria** play major roles in health. They provide colonization resistance against potentially pathogenic organisms, aid in digestion and absorption, produce vitamins and SCFA's, and stimulate the GI immune system. DNA probes allow detection of multiple species (sp.) within a genus, so the genera that are reported cover many species.

**Opportunistic Bacteria** may cause symptoms and be associated with disease. They can affect digestion and absorption, nutrient production, pH and immune state. Antibiotic sensitivity tests will be performed on all opportunistic bacteria found, although clinical history is usually considered to determine treatment since the organisms are not generally considered to be pathogens.

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**2100 Gastrointestinal Function Profile**

Methodology: DNA Analysis, GC/MS, Microscopic, Colorimetric, Automated Chemistry, ELISA

**Pathogenic Bacteria** 95% Reference Range

Helicobacter pylori	<0.01	<=1.0E+005
Clostridium difficile	<0.01	<=1.0E+005
E.H.E. coli	<0.01	<=1.0E+005
Campylobacter sp.	<0.01	<=1.0E+005

**Yeast/Fungi** Expected Value

Candida sp. +1 => 100 pg DNA/g specimen Neg

**Yeast/Fungi**

Yeast overgrowth has been linked to many chronic conditions, in part because of antigenic responses in some patients to even low rates of yeast growth. Potential symptoms include diarrhea, headache, bloating, atopic dermatitis and fatigue. Positives are reported as +1, +2, +3 or +4 indicating >100, >1000, >10000 or >100000 pg DNA/g.

**Parasites** Expected Value

Blastocystis hominis Positive Neg

**Parasites**

Parasite infections are a major cause of non-viral diarrhea. Symptoms may include constipation, gas, bloating, increased allergy response, colitis, nausea and distention.

**Adiposity Index**

Firmicutes	41		<= 80
Bacteroidetes	59		>= 20

The **Adiposity Index** is derived by using DI probes that detect multiple genera of the phyla Firmicutes and Bacteroidetes. Abnormalities of these phyla may be associated with increased caloric extraction from food.

**Drug Resistance Genes**

aacA, aphD	Pos	gyrB, ParE	Neg
mecA	Neg	PBP1a, 2B	Neg
vanA, B, and C	Neg		

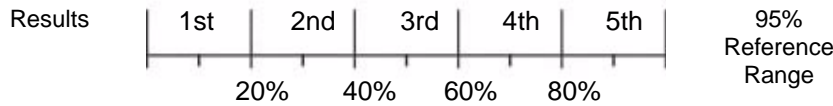
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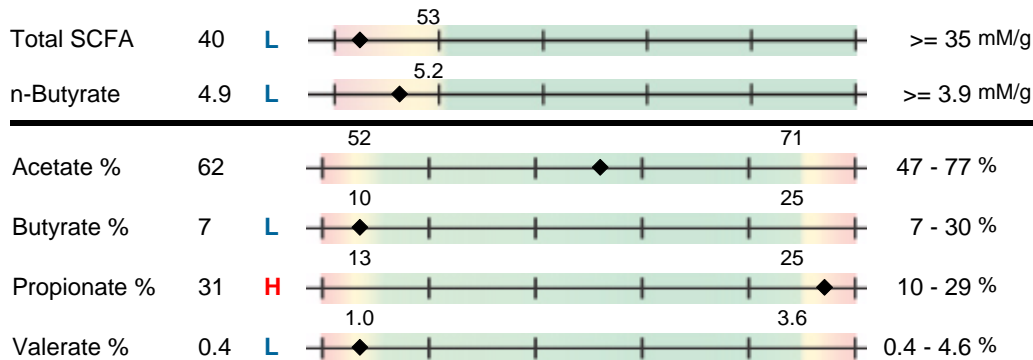
**2100 Gastrointestinal Function Profile**

Methodology: DNA Analysis, GC/MS, Microscopic, Colorimetric, Automated Chemistry, ELISA

**Percentile Ranking by Quintile**



**Beneficial SCFA**



**Beneficial SCFA**

**Short chain fatty acids (SCFA)** are produced by bacterial fermentation of dietary polysaccharides and fiber. The product, N-butyrate, is taken up and used to sustain the normal activity of colonic epithelial cells. Butyrate has been shown to lower the risk of colitis and colorectal cancer. A healthy balance of GI microbes depends on production of SCFA by or specie to allow the normal growth of another on in a complex cross-feeding network.

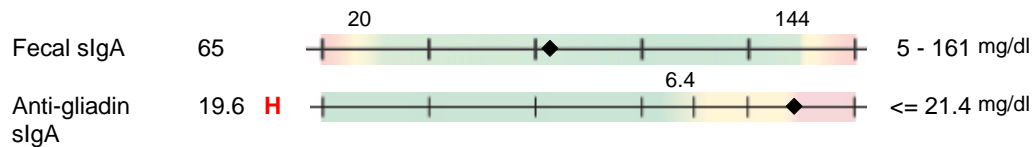
**Inflammation**



**Inflammation**

**Lactoferrin**, an iron-binding glycoprotein, is released in IBD but not in non-inflammatory IBS. High levels are found in Crohn's, UC or infection. WBC's are elevated in general inflammation/infection. Mucus is often visualized in acute GI inflammation.

**Immunology**



**Immunology**

High fecal sIgA indicates immune system reactions to the presence of antigens from bacteria, yeast or other microbes. Low sIgA can result from stress or malnutrition. Anti-gliadin sIgA is a screening marker for gluten sensitivity.



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**2150 Sensitivity - Bacteria**

Methodology: DNA Analysis, ELISA

Pharmaceuticals	Sensitive	Resistant
Amoxicillin		R
Ampicillin		R
Cefuroxime		R
Ciprofloxacin		R
Clindamycin		R
Erythromycin		R
Levofloxacin		R
Potassium Clavula		R
Rifaximin	S	
Sulfamethoxazole	S	
Tetracyclin		R
Trimethoprim-Sulfa		R

Bacterial growth suppression is measured in a liquid growth medium where fungal growth is suppressed and specific antibacterial agents are introduced before incubation. In contrast to the old isolation and culture techniques, such universal culturing more closely approximates the actions of antibacterials in the complex milieu of the colon.

Agents marked as "**Sensitive**" cause effective bacterial growth suppression. Those antibacterial agents are candidates for suppressing the growth of bacteria in the patient's colon. The results apply to all organisms reported under "**Opportunistic Bacteria**".

Agents indicated as "**Resistant**" have low effectiveness. If all tested agents are resistant, synergistic mixtures of antibacterial agents may be effective. Agents indicated as "**Resistant**" have low effectiveness. If all tested agents are resistant, synergistic mixtures of antibacterial agents may be effective.

Botanicals	Sensitive	Resistant
5-Hydroxy-1,4-naphthoquinone Black Walnut		R
Alliin Garlic	S	
Arbutin Uva Ursi		R
Artemisinin Wormwood		R
Berberine Goldenseal	S	
Caprylic acid Octanoic acid		R
Carvacrol Oregano	S	
Oleuropein Olive Leaf	S	
Quinic Acid Cats Claw		R
Thymol Oil of Thyme		R
Undecylenic acid Undecylenic acid		R

For Botanical sensitivity testing the active ingredients are tested and an example of the available source is shown.

Sensitivities are not performed on "**Pathogens**" or "**Parasites**" because they do not grow in culture under normal laboratory conditions. Standard protocols are generally used for treatment of pathogens and parasites.

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3425 Corporate Way  
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**2155 Sensitivity - Fungi**

Methodology: DNA Analysis, ELISA

Pharmaceuticals	Sensitive	Resistant
Amphotericin		R
Fluconazole		R
Itraconazole	S	
Ketoconazole	S	
Nystatin	S	

Fungal growth suppression is measured in a liquid growth medium where bacterial growth is suppressed and specific antifungal agents are introduced before incubation. Growth inhibition is measured after incubation. In contrast to the older isolation and culture techniques, such universal culturing more closely approximates the actions of antifungals in the complex milieu of the colon.

Botanicals	Sensitive	Resistant
5-Hydroxy-1,4-naphthoquinone Black Walnut		R
Alliin Garlic	S	
Arbutin Uva Ursi	S	
Artemisinin Wormwood	S	
Berberine Goldenseal		R
Caprylic acid Octanoic acid		R
Carvacrol Oregano		R
Oleuropein Olive Leaf		R
Quinic Acid Cats Claw		R
Thymol Oil of Thyme	S	
Undecylenic acid Undecylenic acid	S	

Agents marked as "**Sensitive**" cause effective fungal growth suppression. Those antifungal agent are candidates for suppressing the growth of fungi and yeasts in the patient's colon. The results apply to all organisms reported under "**Yeast/Fungi**".

Agents indicated as "**Resistant**" have low effectiveness and can increase the risk of inducing drug resistant organisms. If all tested agents are "**Resistant**", synergistic mixtures of antifungal agents may be effective.

Sensitivities are not performed on "**Pathogens**" or "**Parasites**" because they do not grow in culture under normal laboratory conditions. Standard protocols are generally used for treatment of pathogens and parasites.

For Botanical sensitivity testing the active ingredients are tested and an example of the available source is shown.