



Ordering Physician:

Metamatrix Staff & Family

3425 Corporate Way
Duluth, GA 30096

Accession Number: **A0807080001**
Reference Number:
Patient: Sample Report
Age: 40 *Sex:* Male
Date of Birth: 02/05/1968
Date Collected: 7/8/08
Date Received: 7/8/08
Report Date: 7/8/08
Telephone: (770) 446-5483
Fax: (678) 638-2821
Reprinted:
Comment:

0090 ION Profile

Reference Ranges and Graphs

Reference ranges have changed for Sulfate due to method improvements.

For some analytes that are reported as "<DL" (less than detection limit) no point is placed on the chart, and the chart indicates deciles that fall below the detection limit.

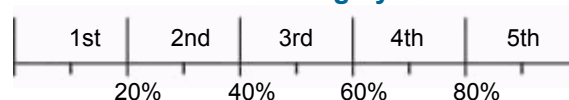
Amino Acid Analysis - 20 Plasma

Methodology: ION Exchange HPLC

Ranges are for ages 13 and over.

Results
umol/L

Percentile Ranking by Quintile



**95%
Reference
Interval**

Essential Amino Acids

Rank	Amino Acid	Result (umol/L)	Percentile	95% Reference Interval
1	Arginine	80	~65%	39 - 115
2	Histidine	64	~30%	42 - 96
3	Isoleucine	45	~30%	31 - 88
4	Leucine	83	~20%	60 - 152
5	Lysine	136	~20%	95 - 216
6	Methionine	18	~30%	13 - 28
7	Phenylalanine	49	~25%	39 - 76
8	Threonine	126	~85%	57 - 165
9	Tryptophan	44	~45%	26 - 61
10	Valine	167	~25%	118 - 295

Essential Amino Acid Derivatives

Neuroendocrine Metabolism

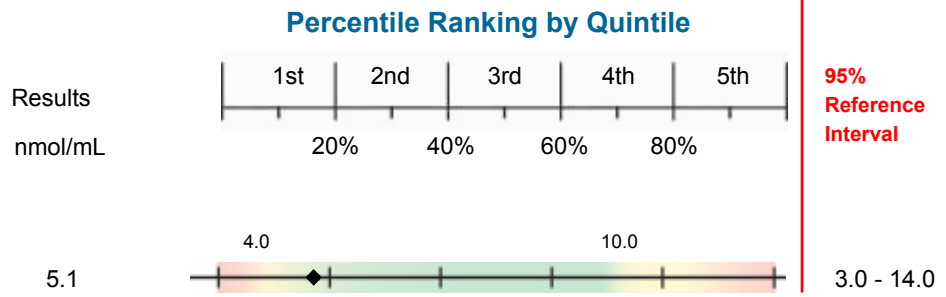
Rank	Amino Acid	Result (umol/L)	Percentile	95% Reference Interval
11	Glycine	202	~40%	124 - 431
12	Serine	95	~85%	48 - 119
13	Taurine	28 L	~10%	25 - 116
14	Tyrosine	57	~65%	31 - 85

Ammonia/Energy Metabolism

Rank	Amino Acid	Result (umol/L)	Percentile	95% Reference Interval
15	Asparagine	41	~65%	25 - 58
16	Aspartic Acid	8	~55%	4 - 15
17	Citrulline	26	~30%	16 - 49
18	Glutamic Acid	56	~65%	19 - 153
19	Glutamine	536	~85%	303 - 626
20	Ornithine	44	~30%	24 - 99

Homocysteine

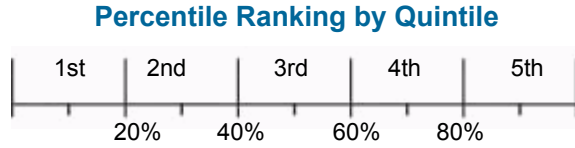
Methodology: Competitive Immunoassay



Element - Erythrocytes and Whole Blood

Methodology: Inductively Coupled Plasma /Mass Spectroscopy

Ranges are for ages 13 and over.



95%
Reference
Interval

Results

Reference Limits

Nutrient Elements

Element	Value	Percentile	Reference Limits	Units
1 Potassium	1521 L	1,585	1,099 - 2,492	ppm packed cells
2 Magnesium *	26	26	18 - 40	ppm packed cells
3 Zinc	<3 L	5.4	4.2 - 9.3	ppm packed cells
4 Copper	351	329	275 - 534	ppb packed cells
5 Manganese	30	27	22 - 43	ppb packed cells
6 Chromium	1.6 L	3.0	1.3 - 7.5	ppb packed cells
7 Selenium	0.17 L	0.19	0.15 - 0.41	ppm whole blood
8 Calcium	20	27	12 - 36	ppm packed cells

Relevant to membrane permeability, not nutritional status.

*The expanded abnormal range approximates the population at risk for magnesium insufficiency disorders. See: Johnson S, Med Hypotheses. Feb 2001;56(2):163-170.

Element - Erythrocytes and Whole Blood

Methodology: Inductively Coupled Plasma /Mass Spectroscopy

Percentile Ranking by Quintile



Toxic Elements

Element	Results ppb	Percentile	Reference Interval
9 Aluminum	85	61	<= 141
10 Arsenic	<2.34	6	<= 17
11 Cadmium	0.5	0.5	<= 1.9
12 Lead	12	20	<= 54
13 Mercury	<0.78	5	<= 20

Results for whole blood toxic elements that are within normal limits do not rule out metal accumulation in other tissues. This can be evaluated by urinary porphyrin or 24-hour urine chelation challenge tests.

Lead Levels Considered Elevated in Adults(1)

- ◆ At levels above 800 ppb, serious, permanent health damage may occur (extremely dangerous).
- ◆ Between 400 and 800 ppb, serious health damage may be occurring, even if there are no symptoms (seriously elevated).
- ◆ Between 250 and 400 ppb, regular exposure is occurring. There is some evidence of potential physiological problems (elevated).
- ◆ Between 100 and 250 ppb, lead is building up in the body and exposure is occurring.

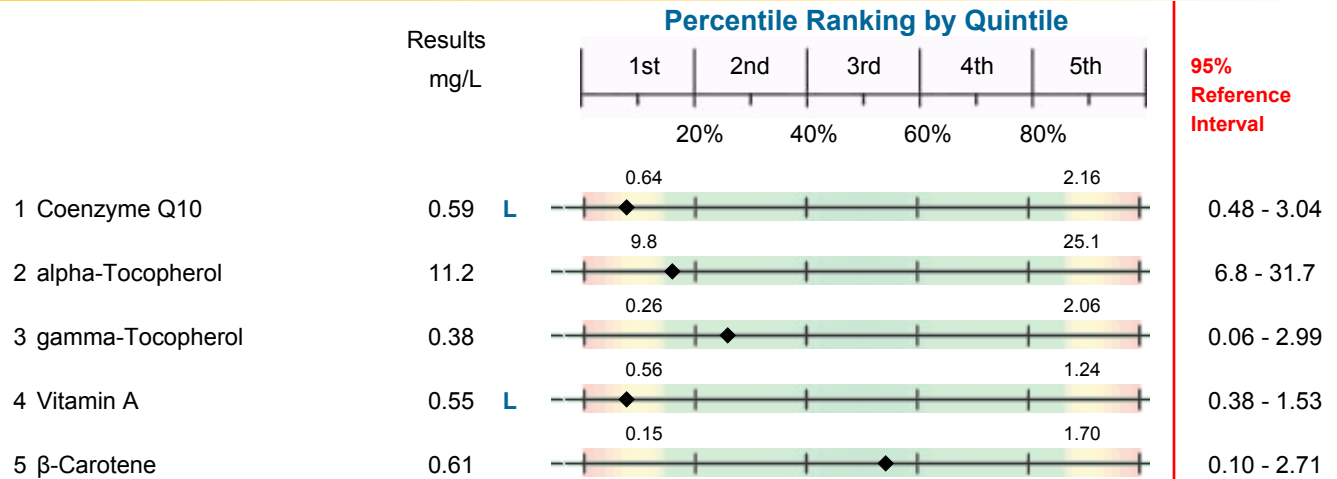
(1)Lead Exposure in Adults. A Guide for Health Care Providers, State of New York, Department of Public Health.

In children, lead levels even below 100 ppb are associated with IQ deficits.(2)

(2) Lanphear BP, Hornung R, Khoury J, et al. Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. *Environ Health Perspect.* Jul 2005;113(7):894-899.

CoEnzyme Q10 Plus Vitamin Panel - Serum

Methodology: High Performance Liquid Chromatography



Lipid Peroxide - Serum

Methodology: High Performance Liquid Chromatography



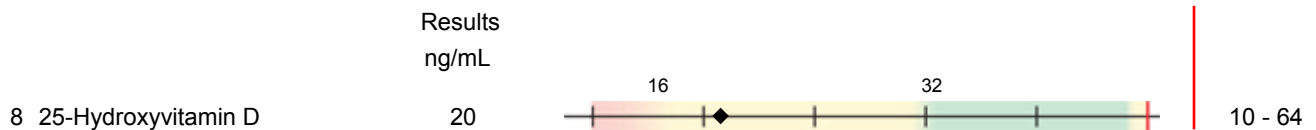
8-Hydroxy-2 deoxyguanosine - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric



Vitamin D - Serum

Methodology: Chemiluminescent immnoassay (CLIA)



Levels of 25-hydroxyvitamin D that fall below 20 ng/mL (50 nmol/L) reflect frank vitamin D deficiency. Studies based on functional markers have identified levels below 30 ng/mL (75 nmol/L) as hypovitaminosis D where stores are depleted and PTH levels may begin to rise. Optimal values lie in the 30-60 ng/ml range (4th and 5th quintiles) for the Metamatrix reference population that comes largely from North America. Extremely high levels may be toxic.

- Holick MF. Vitamin D deficiency. N Engl J Med. 2007;357(3):266-281.
- Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. Feb 2005;135(2):317-322.

Conversion factors: nmol/L = ng/mL x 2.5 | ng/mL = nmol/L x 0.4

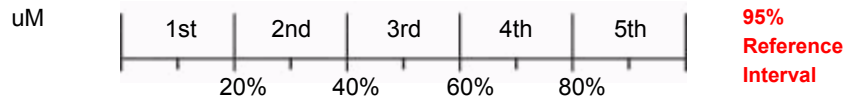
Fatty Acids - Plasma

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Results

Percentile Ranking by Quintile

Ranges are for ages 13 and over.



Polyunsaturated Omega-3

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
1	Alpha Linolenic (18:3n3)	32 L	37	22 - 144
2	Eicosapentaenoic (20:5n3)	28 L	44	19 - 362
3	Docosapentaenoic (22:5n3)	62	46	31 - 112
4	Docosahexaenoic (22:6n3)	159 L	172	95 - 333

Polyunsaturated Omega-6

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
5	Linoleic (18:2n6)	1662	1,571 - 2,807	1,305 - 3,300
6	Gamma Linolenic (18:3n6)	8.3 L	8.9 - 38.1	5.2 - 58.0
7	Eicosadienoic (20:2n6)	23.4	18.0 - 37.0	14.0 - 45.0
8	Dihomogamma Linolenic (20:3n6)	134	88 - 225	64 - 294
9	Arachidonic (20:4n6)	316 L	330 - 633	260 - 750
10	Docosadienoic (22:2n6)	1.9	1.2 - 2.9	0.9 - 3.8
11	Docosatetraenoic (22:4n6)	18.2	11.0 - 38.0	7.0 - 51.0

Polyunsaturated Omega-9

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
12	Mead (20:3n9)	8.0	0.6 - 10.2	0.5 - 13.2

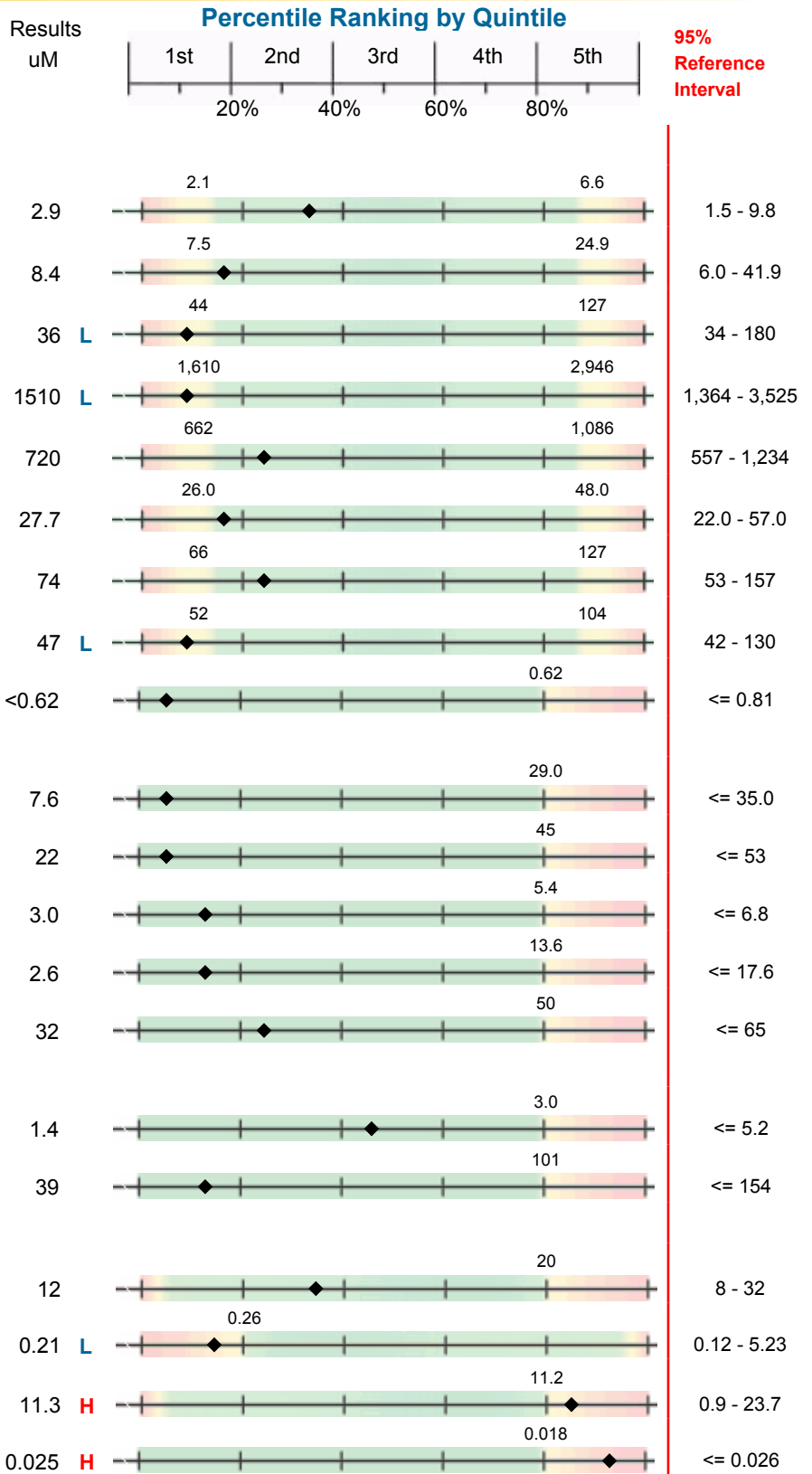
Monounsaturated

Order	Fatty Acid	Result (uM)	Percentile	Reference Interval
13	Myristoleic (14:1n5)	1.4	6.9	<= 11.6
14	Palmitoleic (16:1n7)	37	155	<= 238
15	Vaccenic (18:1n7)	96	87 - 175	74 - 209
16	Oleic (18:1n9)	1606	1,079 - 2,733	1,079 - 2,800
17	11-Eicosenoic (20:1n9)	25.0 H	10.2 - 22.6	8.4 - 29.5
18	Erucic (22:1n9)	3.6	3.6 - 6.8	2.8 - 8.1
19	Nervonic (24:1n9)	96	86 - 161	70 - 189

Fatty Acids - Plasma

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges are for ages 13 and over.

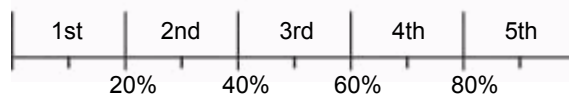


Organix™ Comprehensive - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Results are expressed as mcg/mg creatinine.
Ranges are for ages 13 and over.

Percentile Ranking by Quintile



**95%
Reference
Interval**

NUTRIENT MARKERS

Results

Fatty Acid Metabolism
(Carnitine & B2)

1 Adipate	<DL*	6.0	<= 10.6
2 Suberate	2.0 H	1.9	<= 3.4
3 Ethylmalonate	33.5 H	2.0	<= 4.4

Carbohydrate Metabolism
(B1, B3, Cr, Lipoic Acid, CoQ10)

4 Pyruvate	10.4 H	3.3	<= 4.9
5 L-Lactate	3.3	14.0	3.0 - 47.0
6 β-Hydroxybutyrate	4.7 H	2.4	<= 5.6

Energy Production (Citric Acid Cycle)
(B comp., Q10, Amino acids, Mg)

7 Citrate	>2000 H	431	9 - 670
8 Cis-Aconitate	269 H	46	1 - 74
9 Isocitrate	368 H	73	1 - 110
10 α-Ketoglutarate	51.0 H	21.0	<= 33.3
11 Succinate	46.5 H	14.3	<= 27.4
12 Fumarate	2.23 H	0.89	<= 1.59
13 Malate	8.6 H	1.5	<= 2.5
14 Hydroxymethylglutarate	29.4 H	4.1	<= 5.2

B-Complex Vitamin Markers
(B1, B2, B3, B5, B6, Biotin)

15 α-Ketoisovalerate	1.24 H	0.32	<= 0.56
16 α-Ketoisocaproate	1.08 H	0.38	<= 0.63
17 α-Keto-β-Methylvalerate	3.7 H	0.7	<= 1.6
18 Xanthurenate	0.30	0.62	<= 0.93
19 β-Hydroxyisovalerate	29.0 H	4.7	<= 7.9

Methylation Cofactor Markers
(B12, Folate)

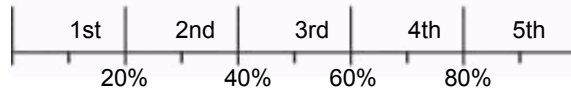
20 Methylmalonate	17.8 H	1.3	<= 2.0
21 Formiminoglutamate	<DL*	1.67	<= 2.94

Organix™ Comprehensive - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.

Percentile Ranking by Quintile



**95%
Reference
Interval**

CELL REGULATION MARKERS

Neurotransmitter Metabolism Markers

(Tyrosine, Tryptophan, B6, antioxidants)

22	Vanilmandelate	5.9 H	1.6	4.2	1.0 - 5.7
23	Homovanillate	3.5	1.6	6.8	0.8 - 13.0
24	5-Hydroxyindoleacetate	7.3	1.6	8.1	0.9 - 50.8
25	Kynurenate	1.3		1.9	<= 2.7
26	Quinolinat	22.8 H		3.5	<= 5.8
27	Picolinate	<DL* L		6.4	1.8 - 11.2

Oxidative Damage and Antioxidant Markers

(Vitamin C and other antioxidants)

28	p-Hydroxyphenyllactate	0.5		0.9	<= 1.8
29	8-Hydroxy-2-deoxyguanosine *	4.9		5.3	<= 7.6

* Units for 8-Hydroxy-2-deoxyguanosine are ng/mg creatinine.

TOXICANTS AND DETOXIFICATION

Detoxification Indicators

(Arg, NAC, Met, Mg and antioxidants)

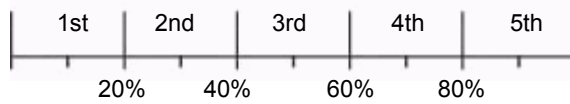
30	2-Methylhippurate	<DL*		0.039	<= 0.073
31	Orotate	1.1 H		0.4	<= 0.8
32	Glucarate	>80 H		7.4	<= 14.9
33	α-Hydroxybutyrate	3.8 H		0.4	<= 1.8
34	Pyroglutamate	7		51	<= 85
35	Sulfate	246 L	986	2,353	762 - 2,778

Organix™ Comprehensive - Urine

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.

Percentile Ranking by Quintile



COMPOUNDS OF BACTERIAL OR YEAST/FUNGAL ORIGIN

Bacterial - general

Compound	Value	Percentile	Reference Range
36 Benzoate	8.1 H	~90%	<= 4.4
37 Hippurate	232	~40%	<= 1,162
38 Phenylacetate	<DL*	~80%	<= 0.01
39 Phenylpropionate	<DL*	~80%	<= 0.4
40 p-Hydroxybenzoate	2.8 H	~90%	<= 2.0
41 p-Hydroxyphenylacetate	13	~60%	<= 40
42 Indican	<DL*	~80%	<= 109
43 Tricarballoylate	1.7 H	~90%	<= 1.9

L. acidophilus / general bacterial

44 D-Lactate	0.9	~50%	<= 6.5
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Clostridial species

45 3,4-Dihydroxyphenylpropionate	<DL*	~80%	<= 0.12
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Yeast / Fungal

46 D-Arabinitol	49	~80%	<= 59
<i>Creatinine = 43 mg/dl</i>			

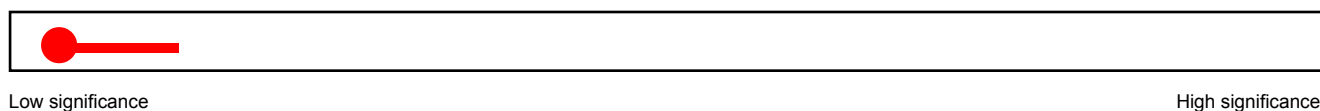
A multi-analyte report can provide greater insight about health risks and special nutrient needs. Patterns of abnormalities can reinforce the degree of significance indicated by a single measurement. Analytes from the various profiles in the ION report are combined below into categories associated with clinical/metabolic conditions.

The categories included cover the most common areas of concern relevant to these profiles. Above each thermometer are listed the analytes used to calculate the *degree of significance*. An H or L appears when the patient result is in the fifth quintile (80%) of the population. An additional **X** next to an analyte indicates that the patient result is outside the 95% reference interval for that analyte.

The thermometer advances to the right as the number and severity of relevant abnormalities increases. The longer the filled bar, the greater the degree of significance or likelihood that a health threat may exist in that category. The preceding laboratory reports provide the detail upon which these thermometers are based.

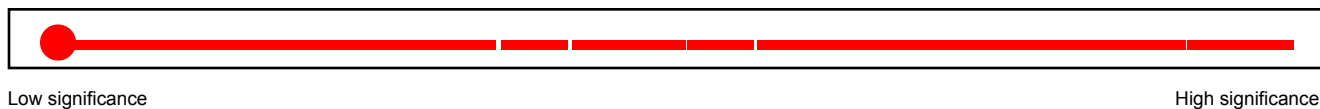
Cardiovascular System

Arginine		Homocysteine		Calcium		Magnesium	
CoQ10	L	a-Tocopherol		g-Tocopherol		Lipid Peroxides	
8-OHdG		AA/EPA	H				



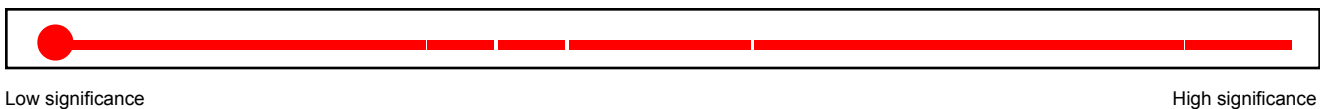
Fatigue

Isoleucine		Leucine		Phenylalanine		Valine	
Magnesium		CoQ10	L	Adipate		Suberate	H
AKG	X H	Succinate	X H	Malate	X H	Xanthurenate	
MeMalonate	X H	FIGLU					



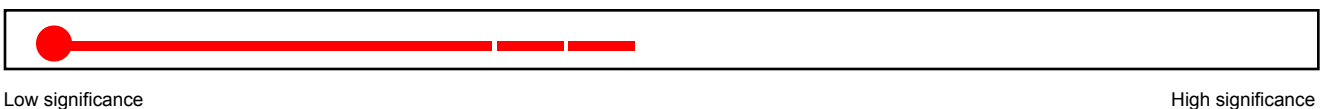
Metabolic Syndrome (Syndrome X)

Chromium	L	Magnesium		Zinc	X L	Palmitic	
Stearic		AHB	X H	BHB	H	BHVal	X H



Mental/Emotional

Tryptophan		Tyrosine		Magnesium		EPA	L
DHA	L	Xanthurenate		MeMalonate	X H	FIGLU	
VMA	X H	5-HIA					



Intestinal Bacterial Metabolites

PhAc	PhProp		pOHBenz	X H	pOHPhAc
Indican	Tricarb	H	D-Lactate		3,4-DHPP

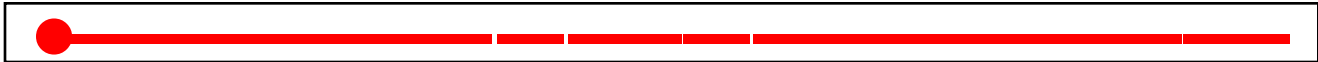


Low significance

High significance

Intestinal Yeasts / Fungal Metabolites

D-Arabinitol	H
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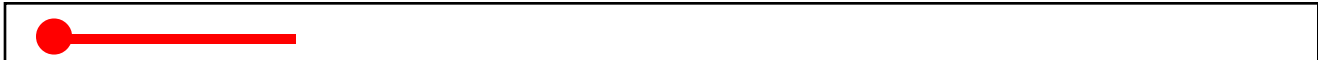


Low significance

High significance

Digestion/Absorption

Arginine	Histidine		Isoleucine		Leucine
Lysine	Methionine		Phenylalanine		Threonine
Tryptophan	Valine		Chromium	L	Copper
Manganese	Selenium	L	Zinc	X L	



Low significance

High significance

Toxic Exposure

Aluminum	H	Cadmium		Lead		Mercury	
Palmitelaidic		C18TrFa		Citrate	X H	Cis-Aconitate	X H
Isocitrate	X H	Quinolate	X H	2-MeHipp		Orotate	X H
Glucarate	X H						



Low significance

High significance

Detoxification Impairment

Methionine	Glycine	Serine		Taurine	L
Glutamine	Pyroglutamate	Sulfate	X L	Benzoate	X H



Low significance

High significance

Oxidative Stress/Antioxidant Insufficiency

Taurine	L	Copper		Manganese		Selenium	L
Zinc	X L	Lead		Mercury		a-Tocopherol	
g-Tocopherol		Vitamin A	L	b-Carotene		Lipid Peroxides	
8-OHdG		pOHPHlac		Sulfate	X L		



Low significance

High significance

Mitochondrial Functional Impairment

Magnesium		CoQ10	L	Adipate		Suberate	H
Ethylmalonate	X H	Pyruvate	X H	L-Lactate		AHB	X H
BHB	H	Succinate	X H	Fumarate	X H	Malate	X H

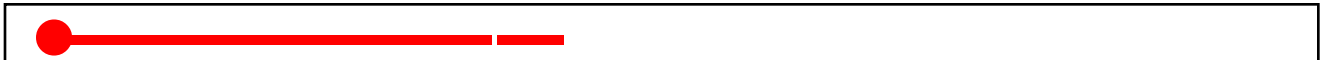


Low significance

High significance

Amino Acid Insufficiency

Arginine		Histidine		Isoleucine		Leucine	
Lysine		Methionine		Phenylalanine		Threonine	
Tryptophan		Valine		AKG	X H	Succinate	X H
Sulfate	X L						



Low significance

High significance

Essential Fatty Acid Insufficiency

ALA	L	EPA	L	DHA	L	LA	
GLA	L	DGLA		Palmitoleic		Mead	
Triene/Tetraene	H						

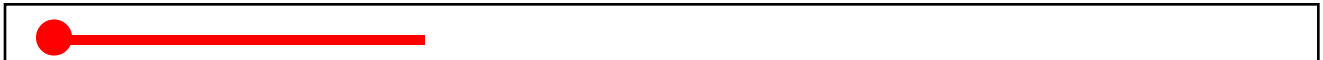


Low significance

High significance

Disordered Methyl Group (Single carbon) Transfer

Homocysteine		Pentadeca		Heptadeca		Nonadecanoic	
Tricosanoic		Xanthurenate		MeMalonate	X H	FIGLU	
Kynurenate							

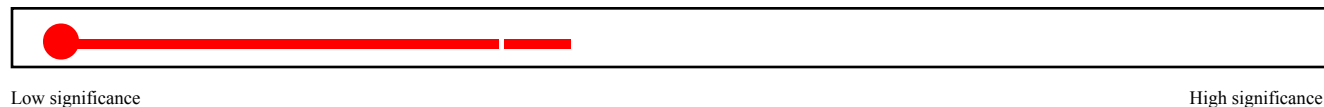


Low significance

High significance

Disordered Tryptophan Metabolism

Tryptophan	Xanthurenate	5-HIA	Kynurenate
Quinolinat	Indican		



Low significance

High significance

<u>Abbreviation</u>	<u>Analyte Name</u>	<u>Abbreviation</u>	<u>Analyte Name</u>
2-MeHipp	2-Methylhippurate	FIGLU	Formiminoglutamate
5-HIA	5-Hydroxyindoleacetate	g-Tocopherol	gamma-Tocopherol
8-OhdG	8-Hydroxy-2-deoxyguanosine	GLA	Gamma Linoleic (18:3n6)
AA/EPA	Arachidonic (20:4n6)/Eicosapentaenoic (20:5n3)	Heptadeca	Heptadecanoic (17:0)
AHB	a-Hydroxybutyrate	Hcys	Homocysteine
aKbMeVal	a-Keto-β-Methylvalerate	HVA	Homovanillate
aKiCap	a-Ketoisocaproate	HMG	Hydroxymethylglutarate
aKiVal	a-Ketoisovalerate	LA	Linoleic (18:2n6)
AKG	a-Ketoglutarate	MeMalonate	Methylmalonate
ALA	Alpha Linolenic (18:3n3)	Pentadeca	Pentadecanoic (15:0)
a-Tocopherol	alpha-Tocopherol	PhAc	Phenylacetate
BHB	β-Hydroxybutyrate	PhProp	Phenylpropionate
BHiVal	β-Hydroxyisovalerate	pHBenz	p-Hydroxybenzoate
C18TrFa	Total C:18 Trans	pHPhAc	p-Hydroxyphenylacetate
CoQ10	Coenzyme Q10	pHPhLac	p-Hydroxyphenyllactate
DGLA	Dihomogamma Linolenic (20:3n6)	Total C:18	Total c:18 Trans
DHA	Docosahexanoic (22:6n3)	Tricarb	Tricarallylate
3,4-DHPP	3,4-Dihydroxyphenylpropionate	Triene/Tetraene	Mead/Arachidonic Ratio
EPA	Eicosapentaenoic (20:5n3)	VMA	Vanilmandelate

Supplement Recommendation Summary

With knowledge of a patient's full medical history and concerns, the ION Profile laboratory results may be used to help create an individually optimized nutritional support program. Based strictly on the results from this test, the summary table below shows estimates of nutrient doses that may help to normalize nutrient-dependent metabolic functions. All amounts are adult doses that should be reduced for children according to body weight.

Customized Vitamin and Mineral Formulation

Nutrients listed in this section are normally contained in a multi-vitamin preparation. "Base" amounts may be used for insurance of health even when no abnormalities are found.

Customized preparations of the multi-vitamin/mineral formula shown below may be produced by compounding pharmacies. If such a product is made according to these specifications each dose should be thoroughly stirred into a few ounces of water or diluted fruit juice to fully release carbonates and avoid stomach bloating effects.

	Daily Amounts	
	Base	Units Added
Vitamin A	2500 IU	5000 IU
B-Carotene	5500 IU	
Vitamin C	250 mg	2000 mg
Vitamin D	400 IU	
Vitamin E (Mixed Tocopherols)	100 IU	400 IU
Vitamin K*	100 mcg	
Thiamin (B1)	5 mg	100 mg
Riboflavin (B2)	5 mg	10 mg
Niacin (B3)	25 mg	70 mg
Pyridoxine (B6)	15 mg	
Folic Acid	400 mcg	
Vitamin B12	50 mcg	800 mcg
Biotin	100 mcg	1000 mcg
Pantothenic Acid (B5)	25 mg	100 mg
Calcium	500 mg	500 mg
Iodine*	75 mcg	
Magnesium	250 mg	400 mg
Zinc	15 mg	15 mg
Selenium	100 mcg	200 mcg
Copper	1 mg	
Manganese	5 mg	2 mg
Chromium	200 mcg	200 mcg
Molybdenum*	25 mcg	
Boron*	1 mg	
Citric Acid*	200 mg	
Malic Acid*	200 mg	

* Nutrients with an asterisk are not modified based on the ION test results.

MM03

Other Items Indicated for individual supplementation

Various conditionally essential nutrients and other potentially beneficial interventions appear in this section only if relevant abnormalities are present. These ingredients are not included in the customized vitamin formula on the previous page.

Amino acids listed on this page result from functional markers of individual amino acid insufficiency and do not reflect amino acids measured in plasma.

Item	Amount
Potential to Benefit from Probiotics	Nil
Antifungals	As needed
Arginine	2000 mg
Black Currant Oil	6 gm
Carnitine	800 mg
Coenzyme Q10	400 mg
Fish Oil	6 gm
Glycine	3000 mg
Lipoic Acid	300 mg
N-Acetylcysteine	750 mg
Need for Other Antioxidants	Moderate
Potassium	600 mg
Vanadium	200 mcg

Customized Free-Form Amino Acids

The table below shows the recommended custom amino acid formula based on the results of your laboratory test for fasting plasma amino acid levels. The Base Formula contains a constant percentage of the essential amino acids. To achieve your optimal formula, additional amounts of individual amino acids ("Grams Added") are added and the "Base Formula amount" is adjusted to assure the total appropriate amount of powder. The final percentage in your powder will be different from those in the table because of the addition of specific amounts of each essential amino acid.

Directions: Adults mix 1 and 1/2 measuring teaspoon (5g) into juice or water 2 times daily between meals as a dietary supplement, or as directed by a health care practitioner. Children under 12 years old: 1 teaspoon 1-2 times daily between meals.

Base Formula amount:	272 gm	% of Base	Grams Added	mg per day
	5-Hydroxytryptophan*	0.00 % +	1	33
	Arginine	9.40 % +	0	852
	Histidine	10.10 % +	0	916
	Isoleucine	9.40 % +	0	852
	Leucine	12.90 % +	0	1170
	Lysine	9.40 % +	0	852
	Methionine	7.70 % +	0	698
	Phenylalanine	12.90 % +	0	1170
	Taurine	0.00 % +	27	900
	Threonine	8.10 % +	0	734
	Valine	11.10 % +	0	1006
	Pyridoxal-5-phosphate	.3 % +	0	27
	Alpha-ketoglutaric acid	8.5 % +	0	771
	*...or L-Tryptophan (Requires doctor's order)		5	167

Only the essential amino acids are included in this formula because from these all of the other amino acids can be formed, raising the levels of any that might be low. Pyridoxal-5-phosphate (an active form of B6) and alpha-ketoglutaric acid cofactor nutrients are key factors needed for the body's utilization of amino acids. The formula may be ordered as a powder that dissolves easily in beverages or may be added to foods such as applesauce. Other forms of supplemental dietary protein or amino acids may need to be restricted while using your customized formula. If enhanced energy levels prevent sleep, avoid bedtime use.

In your organic acid profile, your level of urinary orotate was elevated. Caution should be exercised when supplementing clinical amounts of amino acids.