Diagnostic Solutions laboratory

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Patient: Ozzy Dennis
Collected: 6/25/2023
DOB: 3/8/2018
External ID #:

Accession: 20230705-0217
Received: 7/5/2023
Completed: 7/17/2023
Ordered by: Reine DuBois, ND

OMX ORGANIC METABOLOMICS

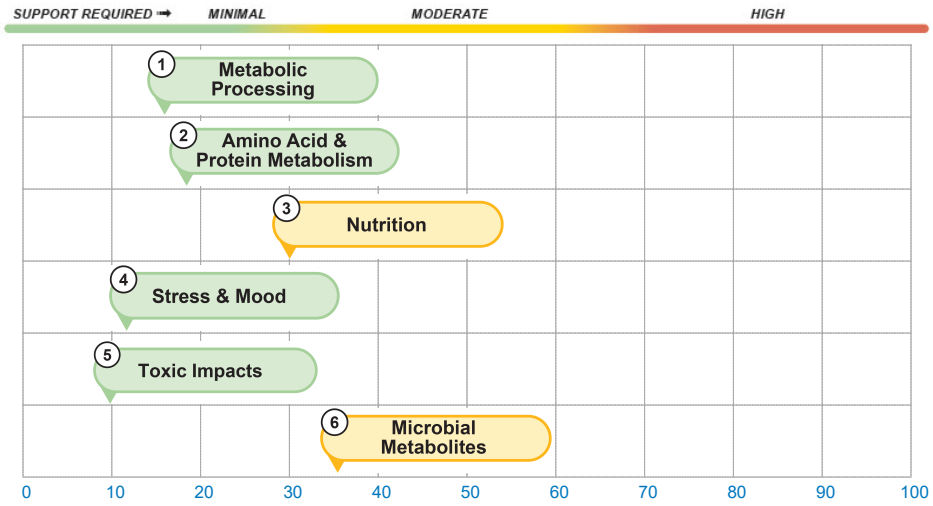
METHODOLOGY: LC-MS/MS - OMX Urine

YOUR PERSONALIZED REPORT

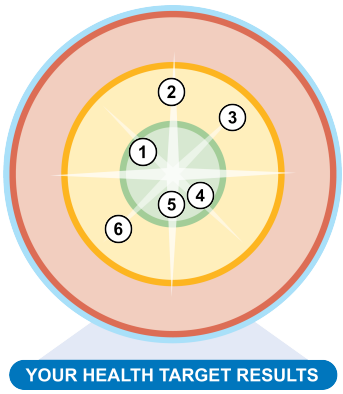
The charts on this page are designed to give you a bird's-eye-view of your current metabolic signature and help you get a general preview of the detailed report found on the following pages.

METABOLOMIC SIGNATURE

Identifying Impact of Functional Categories



PERCENT OF MARKERS BEYOND THE REFERENCE RANGE



YOUR HEALTH TARGET RESULTS

Findings show that 2 of 6 Functional Categories have markers beyond the reference range.

Subcategories are identified below.

Identifying Impact of Subcategories

NOTE: Below is a list of the Functional Categories and the included subcategories. It lists the percentage of markers that are beyond the reference range so clinicians can better target areas of concern.

PERCENT OF MARKERS BEYOND THE REFERENCE RANGE

0-20%	21-60%	61-100%
MINIMAL	*MODERATE*	*HIGH*

1 Metabolic Processing — 18 %

Subcategory
Glycolysis
Krebs Cycle
Fatty Acid Oxidation
Ketones

2 Amino Acid & Protein Metabolism — 20 %

Subcategory
Phenylalanine Metabolism
Branched-Chain Amino Acids
Tryptophan Metabolism
Methionine Metabolism
Histidine Metabolism
Threonine/Glycine/Serine
Lysine Metabolism
Glutamate & Aspartate
Collagen Catabolism

3 Nutrition — 29 %

Subcategory
B-Complex (B1, B2, B3, B5, LA)
Vitamin B-12
Folate
Vitamin B6
Biotin
Plant Components
Meat intake
Sugar Intake

4 Stress & Mood — 14 %

Subcategory
Neurotransmitter
Catecholamine Turnover
Serotonin Turnover
Steroid Hormone

5 Toxic Impacts — 13 %

Subcategory
Oxidative Damage
Toxins
Urea Cycle
Kidney Impacts

6 Microbial Metabolites — 33 %

Subcategory
Amino Acid Microbial Metabolites
Polyphenols Microbial Metabolites
Isoflavone microbial Metabolites
Fungal Assessment

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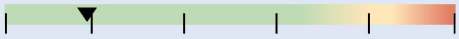
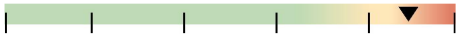
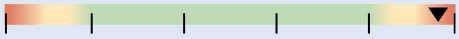
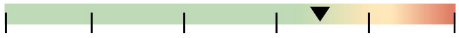
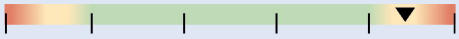
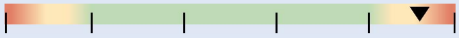
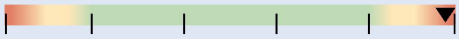
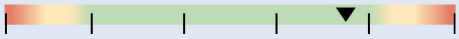
CLIA# 11D-2097795
Medical Director - Diane Farhi, MD

Patient: Ozzy Dennis **Accession: 20230705-0217**

ORGANIC METABOLOMICS

1 - Metabolic Processing

Glycolysis	Result	20% 40% 60% 80%	Reference
Glucose *Glucokinase*	2.1		< 15.2 mg/dL
Pyruvic Acid *Pyruvate dehydrogenase + B1, B2, B3, B5 LA*	45.8		< 67.4 nmol/mg Creatinine
Lactic Acid *Lactate dehydrogenase + B3*	>667.0		12.2 - 458.2 nmol/mg Creatinine
D-Lactic Acid *D-Lactate dehydrogenase*	22.9		< 88.3 nmol/mg Creatinine
Alanine *Alanine transaminase + B6*	302.7		47.2 - 439.0 nmol/mg Creatinine

Krebs Cycle	Result	20% 40% 60% 80%	Reference
Citric Acid *Citrate synthase*	1161.2		203.0 - 3208.6 nmol/mg Creatinine
***cis*-Aconitic Acid** *Aconitase*	876.2 H		126.3 - 668.9 nmol/mg Creatinine
Isocitric Acid *Isocitrate dehydrogenase + B3*	649.6		137.1 - 794.9 nmol/mg Creatinine
α-Ketoglutaric Acid *alpha-Ketoglutarate dehydrogenase + B1, B2, B3, B5, LA*	38.8		< 169.6 nmol/mg Creatinine
Succinic Acid *Succinic dehydrogenase + B2*	311.9 H		12.3 - 260.4 nmol/mg Creatinine
Fumaric Acid *Fumarase*	6.1		< 16.1 nmol/mg Creatinine
Malic Acid *Malate dehydrogenase + B3*	10.7		1.0 - 27.1 nmol/mg Creatinine

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CLIA# 11D-2097795
Medical Director - Diane Farhi, MD

1 - Metabolic Processing

Fatty Acid Oxidation	Result	20% 40% 60% 80%	Reference
Adipic Acid *Saturated dicarboxylic acid*	7.9		4.3 - 55.6 nmol/mg Creatinine
Suberic Acid *Fatty acid oxidation + Carnitine*	2.1		0.7 - 9.3 nmol/mg Creatinine
Sebacic Acid *Fatty acid oxidation + Carnitine*	4.9		1.5 - 21.0 nmol/mg Creatinine
Pimelic Acid *Saturated dicarboxylic acids*	7.7		1.5 - 24.8 nmol/mg Creatinine
Hexanoylglycine *Medium-chain acyl glycines*	4.4		0.7 - 9.6 nmol/mg Creatinine
Suberylglycine *Medium-chain acyl glycines*	<DL		< 0.4 nmol/mg Creatinine
3-Phenylpropionylglycine *Medium-chain acyl glycines*	<DL		< 0.5 nmol/mg Creatinine
Ethylmalonic Acid *Dicarboxylic acid*	108.6 H		9.9 - 65.6 nmol/mg Creatinine
2-Methylsuccinic Acid *Dicarboxylic acid*	6.3		3.7 - 36.0 nmol/mg Creatinine

Ketones	Result	20% 40% 60% 80%	Reference
β-Hydroxybutyric Acid *beta-Hydroxybutyrate dehydrogenase + B3*	30.0		3.2 - 116.4 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Phenylalanine Metabolism	Result	20% 40% 60% 80%	Reference
Phenylalanine *Phenylalanine hydroxylase + BH4*	62.5		7.4 - 69.6 nmol/mg Creatinine
Phenylacetic Acid *Aldehyde dehydrogenase*	<DL		< 8.7 nmol/mg Creatinine
Tyrosine *Tyrosine hydroxylase + BH4*	<DL		< 99.0 nmol/mg Creatinine
Homovanillic Acid *COMT + Magnesium & Monoamine oxidase + B2*	31.4		< 42.1 nmol/mg Creatinine
Vannilylmandelic Acid *Monoamine oxidase + B2*	27.9		5.3 - 36.1 nmol/mg Creatinine
4-Hydroxyphenylpyruvic Acid *Tyrosine aminotransferase + B6*	117.7		< 355.9 nmol/mg Creatinine
Homogentisic Acid *4-Hydroxyphenylpyruvate dioxygenase + Iron*	<DL		< 153.7 nmol/mg Creatinine

Branched-Chain Amino Acids	Result	20% 40% 60% 80%	Reference
Total Branched Chain Amino Acids *Branched-chain amino acid transaminase + B6*	68.2		< 107.4 nmol/mg Creatinine
Valine *Branched-chain amino acid transaminase + B6*	32.4		< 51.1 nmol/mg Creatinine
α-Ketoisovaleric Acid *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	<DL		< 6.1 nmol/mg Creatinine
Isoleucine/allo-Isoleucine *Branched-chain amino acid transaminase + B6*	6.2		< 18.3 nmol/mg Creatinine
α-Keto-β-methylvaleric Acid *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	<DL		< 83.5 nmol/mg Creatinine
Leucine *Branched-chain amino acid transaminase + B6*	29.7		< 44.8 nmol/mg Creatinine
α-Ketoisocaproic Acid *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	3.7		< 20.4 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Tryptophan Metabolism	Result	20% 40% 60% 80%	Reference
Tryptophan *Tryptophan-2,3-dioxygenase/Indoleamine-2,3-dioxygenase*	77.5 H		10.1 - 74.3 nmol/mg Creatinine
5-Hydroxyindoleacetic Acid *Aldehyde dehydrogenase + B3*	29.1 H		< 23.3 nmol/mg Creatinine
Kynurenine *Kynurenine mono-oxygenase (KMO) + B2*	<DL		< 11.6 nmol/mg Creatinine
KT Ratio *Kynurenine / Tryptophan*	<DL		< 0.313
Hydroxykynurenine *Kynureninase + B6*	<DL		< 18.0 nmol/mg Creatinine
Xanthurenic Acid *Kynurenine transaminase + B6*	11.7 H		0.6 - 10.2 nmol/mg Creatinine
Anthranilic Acid *Kynureninase + B6*	7.8		< 11.9 nmol/mg Creatinine
Picolinic Acid *Non-enzymatic conversion*	<DL		< 4.0 nmol/mg Creatinine
Kynurenic Acid *Kynurenine transaminase + B6*	84.4 H		7.8 - 54.0 nmol/mg Creatinine
Quinolinic Acid *Quinolinic acid phosphoribosyltransferase*	228.0 H		29.4 - 178.5 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Methionine Metabolism	Result	20% 40% 60% 80%	Reference
Methionine *Methionine adenosyltransferase*	<DL		< 9.1 nmol/mg Creatinine
Homocystine *Methionine synthase + B12*	<DL		< 2.6 nmol/mg Creatinine
Cystathionine *Cystathionine gamma-lyase + B6*	36.2		2.5 - 57.5 nmol/mg Creatinine
Sulfocysteine *Sulfite oxidase (SOX) + Mo*	8.1		< 12.1 nmol/mg Creatinine
Taurine *Hypotaurine dehydrogenase*	853.7		39.2 - 2436.6 nmol/mg Creatinine
Cystine *Oxidation*	39.7		< 48.5 nmol/mg Creatinine
α-Hydroxybutyric Acid *Dehydrogenase + B3*	39.1		15.4 - 95.6 nmol/mg Creatinine
α-Ketobutyric Acid *Lactate dehydrogenase + B3*	8.7		< 12.6 nmol/mg Creatinine
Pyroglutamic Acid *5-Oxoprolinase*	508.3		75.8 - 543.8 nmol/mg Creatinine

Histidine Metabolism	Result	20% 40% 60% 80%	Reference
Histidine *Histidine decarboxylase + B6*	1484.6 H		106.9 - 1235.7 nmol/mg Creatinine
3-Methylhistidine *Myofibrillar Breakdown*	126.9		28.2 - 2371.9 nmol/mg Creatinine
β-Alanine *Carnosine synthase*	3.5		< 9.2 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Threonine/Glycine/Serine	Result	Reference
Threonine *Glycine C-acetyltransferase + B6*	**154.0**	4.2 - 224.1 nmol/mg Creatinine
Glycine *Glutathione synthetase*	**2552.8**	231.3 - 3103.3 nmol/mg Creatinine
Serine *Cystathionine beta-synthase + B6, Iron*	**464.1**	6.3 - 554.2 nmol/mg Creatinine
GSG Index *Glutamic Acid / (Serine + Glycine)*	**0.097 H**	0.005 - 0.085
Sarcosine *Sarcosine dehydrogenase + B2*	**<DL**	< 118.1 nmol/mg Creatinine
Ethanolamine *Ethanolamine kinase*	**448.8**	108.8 - 492.4 nmol/mg Creatinine
Phosphoethanolamine *Phosphoethanolamine cytidylyltransferase*	**42.2**	< 55.0 nmol/mg Creatinine

Lysine Metabolism	Result	Reference
Lysine *alpha-Aminoadipic semialdehyde synthase*	**190.0**	13.7 - 329.3 nmol/mg Creatinine
α-Aminoadipic Acid *Aminotransferase + B6*	**39.7**	7.4 - 63.2 nmol/mg Creatinine
Glutaric Acid *Glutaryl-CoA dehydrogenase + B2*	**0.9**	< 8.5 nmol/mg Creatinine

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2 - Amino Acid & Protein Metabolism

Glutamate & Aspartate	Result	Reference
Glutamine *Glutaminase*	454.5	11.8 - 538.4 nmol/mg Creatinine
Glutamic Acid *Glutamate cysteine ligase*	293.4 H	7.2 - 129.2 nmol/mg Creatinine
Glutamine / Glutamate Ratio *Glutaminase*	1.5	0.1 - 30.5
Asparagine *Asparaginase*	165.2 H	14.0 - 159.7 nmol/mg Creatinine
Aspartic Acid *Asparagine synthase*	43.1	< 47.5 nmol/mg Creatinine

Collagen Catabolism	Result	Reference
Proline *Prolyl hydroxylase + Vitamin C*	30.6 H	< 27.9 nmol/mg Creatinine
Hydroxyproline *4-Hydroxyproline oxidase*	23.3	< 25.2 nmol/mg Creatinine
Glycylproline *Dipeptide of Glycine + Proline*	212.3 H	< 18.9 nmol/mg Creatinine

3 - Nutrition

B-Complex (B1, B2, B3, B5, LA)	Result	Reference
Branched Chain Alpha-Keto Organic Acids *Branched-chain keto acid dehydrogenase + B1, B2, B3, B5, LA*	3.7	2.2 - 91.9 nmol/mg Creatinine
α-Ketoglutaric Acid *alpha-Ketoglutarate dehydrogenase + B1, B2, B3, B5, LA*	38.8	< 169.6 nmol/mg Creatinine
Pyruvic Acid *Pyruvate dehydrogenase + B1, B2, B3, B5, LA*	45.8	< 67.4 nmol/mg Creatinine

Vitamin B-12	Result	Reference
Methylmalonic Acid *Methylmalonyl-CoA mutase + B12*	30.5 H	< 24.9 nmol/mg Creatinine

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3 - Nutrition

	Result	20% 40% 60% 80%	Reference
Folate			
Formiminoglutamic Acid *Glutamate formimino-transferase + Folate*	1.6		< 2.7 nmol/mg Creatinine
Vitamin B6			
Pyridoxic Acid *Aldehyde oxidase*	<DL		< 98.3 nmol/mg Creatinine
Xanthurenic Acid *Kynurenine transaminase + B6*	11.7 H		0.6 - 10.2 nmol/mg Creatinine
Biotin			
β-Hydroxyisovaleric Acid *Methylcrotonyl-CoA carboxylase + Biotin*	26.3		< 102.8 nmol/mg Creatinine
Plant Components			
Quercetin *Polyphenol: Flavonoid*	<DL		< 14.9 nmol/mg Creatinine
Tartaric Acid *Plant component*	8.3 L		9.9 - 408.4 nmol/mg Creatinine
Meat intake			
1-Methylhistidine *Dietary meat & fish*	337.4		100.8 - 343.0 nmol/mg Creatinine
Carnosine *Carnosinase*	62.2 H		< 41.7 nmol/mg Creatinine
Anserine *Anserinase*	23.5		< 224.5 nmol/mg Creatinine
Sugar Intake			
Fructose *Fructokinase*	0.5		< 4.7 nmol/mg Creatinine

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4 - Stress & Mood

Neurotransmitter	Result	20% 40% 60% 80%	Reference
γ-Aminobutyric Acid *gamma-Aminobutyric acid aminotransferase + B6*	<DL		< 9.5 nmol/mg Creatinine

Catecholamine Turnover	Result	20% 40% 60% 80%	Reference
Homovanillic Acid *COMT + magnesium & monoamine oxidase + B2*	31.4		< 42.1 nmol/mg Creatinine
Vannilylmandelic Acid *Monoamine oxidase + B2*	27.9		5.3 - 36.1 nmol/mg Creatinine

Serotonin Turnover	Result	20% 40% 60% 80%	Reference
5-Hydroxyindoleacetic Acid *Aldehyde dehydrogenase + B3*	29.1 H		< 23.3 nmol/mg Creatinine

Steroid Hormone	Result	20% 40% 60% 80%	Reference
Cortisol *11-beta-Hydroxysteroid dehydrogenase + B3*	53.9		< 82.0 mcg/g Creatinine
Cortisone *11-beta-Hydroxysteroid dehydrogenase + B3*	37.7		< 250.5 mcg/g Creatinine
Aldosterone *Steroid 5-beta reductase*	<DL		< 2.1 mcg/g Creatinine

5 - Toxic Impacts

Oxidative Damage	Result	20% 40% 60% 80%	Reference
8-Hydroxy-2'-deoxyguanosine *DNA oxidation*	2.3		< 6.4 nmol/mg Creatinine

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5 - Toxic Impacts

Toxins	Result	20% 40% 60% 80%	Reference
2-, 3-, and 4-Methylhippuric acid *Xylenes exposure*	<DL		< 0.6 nmol/mg Creatinine
Mandelic Acid *Styrene exposure*	9.0		< 16.9 nmol/mg Creatinine
Benzoylform *Styrene exposure*	0.3		< 3.6 nmol/mg Creatinine
Glucaric Acid *Glucuronic Acid Pathway*	11.2		< 31.5 nmol/mg Creatinine

Urea Cycle	Result	20% 40% 60% 80%	Reference
Arginine *Arginase & Nitric oxide synthase*	11.6		< 26.4 nmol/mg Creatinine
Citrulline *Argininosuccinate synthase*	13.6 H		< 12.6 nmol/mg Creatinine
Ornithine *Ornithine transcarbamylase*	13.9		< 26.8 nmol/mg Creatinine
Homocitrulline *Argininosuccinate synthase*	17.7		< 42.2 nmol/mg Creatinine
Arginosuccinic Acid *Argininosuccinate lyase*	42.4 H		< 29.5 nmol/mg Creatinine

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5 - Toxic Impacts

Kidney Impacts	Result	20% 40% 60% 80%	Reference
Orotic Acid *Uridine monophosphate synthase*	**6.2**		1.2 - 13.1 nmol/mg Creatinine
pH	**7.3**		5.5 - 7.7
Microalbumin *Blood protein*	**19.7**		< 130.4 mcg/mg Creatinine
Phosphate *Charged particle (ion)*	**85.3**		11.2 - 192.4 mg/dL
Creatinine *Creatine breakdown*	**166.4**		29.3 - 296.8 mg/dL
Oxalic Acid *Divalent metallic cations*	**468.4**		144.9 - 1749.5 nmol/mg Creatinine

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6 - Microbial Metabolites

Amino Acid Microbial Metabolites	Result	Reference
4-Hydroxyphenylacetic Acid *Disordered tyrosine metabolism*	262.7	43.1 - 528.1 nmol/mg Creatinine
Indoleacetic Acid *Disordered tryptophan metabolism*	23.5	3.0 - 55.5 nmol/mg Creatinine

Polyphenols Microbial Metabolites	Result	Reference
3,4-Dihydroxyhydrocinnamic Acid *Polyphenol metabolite*	1.5	< 4.4 nmol/mg Creatinine
3,5-Dihydroxybenzoic Acid *Microbial metabolite*	88.2	< 521.8 nmol/mg Creatinine
4-Hydroxybenzoic Acid *Hydroxybenzoic acid derivative*	62.7 H	1.4 - 15.7 nmol/mg Creatinine
Benzoic Acid *Glycine N-benzoyltransferase*	2597.3 H	< 621.4 nmol/mg Creatinine
Hippuric Acid *Glycine conjugate of benzoate*	1287.2	198.7 - 3104.6 nmol/mg Creatinine

Isoflavone microbial Metabolites	Result	Reference
Equol *Isoflavone metabolite*	7.2	< 15.4 nmol/mg Creatinine

Fungal Assessment	Result	Reference
Arabinitol *Dehydrogenase*	12.9 H	< 9.0 nmol/mg Creatinine

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PERSONALIZED METABOLOMIC RECOMMENDATIONS

Note: Nutrient supplementation is up to the treating clinician's discretion with full understanding of the patient's medical history and current clinical condition.

MICRONUTRIENTS	*Support Required*	Recommendations	Food Sources
B-Complex	None	No Additional Support	Mixed diet
Thiamin (B1)	None	1.2 mg*	Rice, wheat germ, lentils, peas, pork, whole wheat bread, spinach
Riboflavin (B2)	Moderate	30 mg	Milk, almonds, eggs, salmon, chicken, broccoli, spinach
Niacin (B3)	None	16 mg*	Chicken, tuna, turkey, cereal, peanuts, lentils, coffee
Cobalamine (B12)	High	500 mcg	Clams, mussels, mackerel, crab, beef, salmon, milk, eggs
Folate (B9)	None	400 mcg DFE*	Lentils, garbanzo beans, spinach, asparagus, lima beans, orange juice
Biotin (B7)	None	30 mcg*	Eggs, liver, salmon, avocado, raspberries, cauliflower, bread
CoQ10	Moderate	60+ mg	Beef, herring, chicken, canola oil, Rainbow trout, peanuts, pistachio nuts, brocolli
Magnesium	None	420 mg*	Beef, pork, milk, cod, chicken, avocado
Carnitine	None	10+ mg	Beef, pork, milk, cod, chicken, avocado
Copper	None	0.9 mcg	Eastern oysters, crab meat, clams, cashews, sunflowers, hazelnuts, almonds

** DV or Daily Values, are the recommended amounts of nutrients per day for a healthy, non-deficient adult.*

PROTEIN	*Findings*	Suggested Recommendation
Phenylalanine	Adequate	No Additional Support
Isoleucine/allo-Isoleucine	Adequate	No Additional Support
Leucine	Adequate	No Additional Support
Valine	Adequate	No Additional Support
Tryptophan	High	Represents protein intake 24-48 hrs before collection; higher in fish-eaters; check BMI and nutrient cofactors
Methionine	Adequate	No Additional Support
Threonine	Adequate	No Additional Support
Lysine	Adequate	No Additional Support
Histidine	High	Represents protein intake 24-48 hrs before collection; consider liver status, anemia, allergires and asthma; check folate and carnosine levels
Arginine	Adequate	No Additional Support
Glycine	Adequate	No Additional Support
Taurine	Adequate	No Additional Support

ADDITIONAL SUPPORT	*Support Required*	Suggested Recommendation
Glutathione Need	None	No Additional Support
Inflammation	None	No Additional Support
Liver Parameters	Moderate	Consider liver support such as, glycine or serine, omega-3 fatty acids, vitamin E, antioxidants and fiber rich foods; avoid saturated fats and added sugars.
Kidney Parameters	None	No Additional Support