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Date:
(Accession #)

Next Test Due:

LabAssist™ Organic Acids & Environmental Pollutants Report

Practitioner

Basic Status High/Low - Environmental Pollutants Exposure on

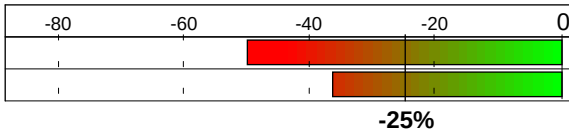
Organic Acids & Environmental Pollutants Date:

/ Age: ( )

Client ID: ( )

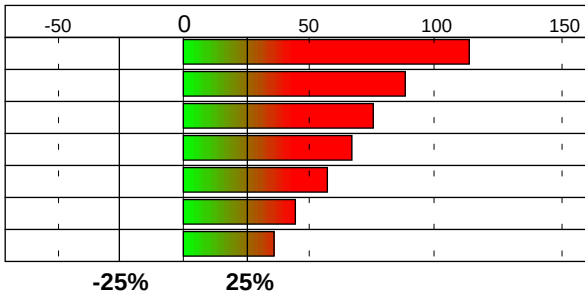
The % Status is the weighted deviation of the laboratory result.

Low Results



	% Status		Result	Low	High
Benzoate	-49.71	**L**	**0.02**	0.00	7.00
p-Hydroxybenzoate	-36.43	**L**	**0.19**	0.00	1.40

High Results



	% Status		Result	Low	High
Hippurate	113.85	**H**	**1101.10**	0.00	672.00
M + P	87.50	**H**	**0.88**	0.00	0.64
Phenylglyoxylate	75.00	**H**	**0.50**	0.00	0.40
Phthalate	66.67	**H**	**0.21**	0.00	0.18
Monoethyl Phthalate	57.69	**H**	**0.14**	0.00	0.13
Mandelate	45.00	**H**	**0.38**	0.00	0.40
a-Hydroxyisobutyrate	36.50	**H**	**6.92**	0.00	8.00

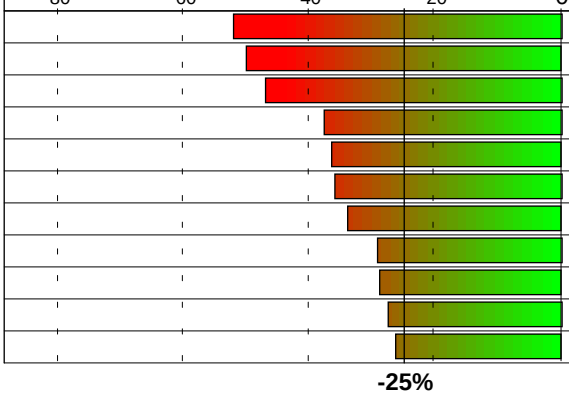
Basic Status High/Low - Urine Organic Acids on

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

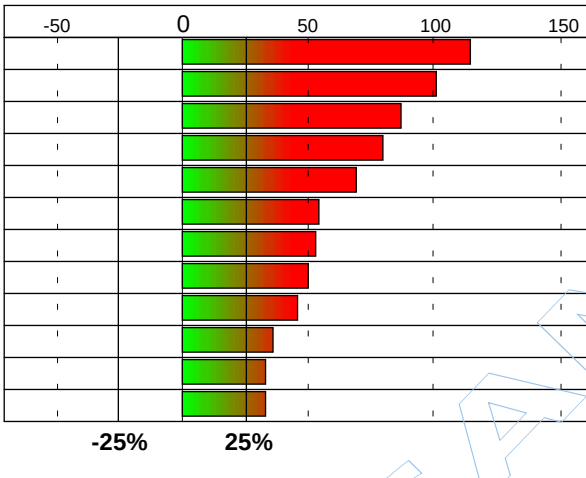
The % Status is the weighted deviation of the laboratory result.

Low Results



	% Status		Result	Low	High
3-Indoleacetate	-52.02	L	**0.40**	0.60	10.50
Benzoate	-49.71	L	**0.02**	0.00	7.00
Citrate	-46.95	L	**56.20**	34.30	751.30
b-Hydroxybutyrate	-37.36	L	**0.91**	0.00	7.20
p-Hydroxybenzoate	-36.43	L	**0.19**	0.00	1.40
a-Hydroxybutyrate	-36.00	L	**0.21**	0.00	1.50
a-Keto-b-methylvalerate	-33.81	L	**0.34**	0.00	2.10
Orotate	-29.09	L	**0.23**	0.00	1.10
b-Hydroxyisovalerate	-28.84	L	**2.37**	0.00	11.20
Methylmalonate	-27.50	L	**0.36**	0.00	1.60
Succinate	-26.27	L	**5.34**	0.00	22.50

High Results



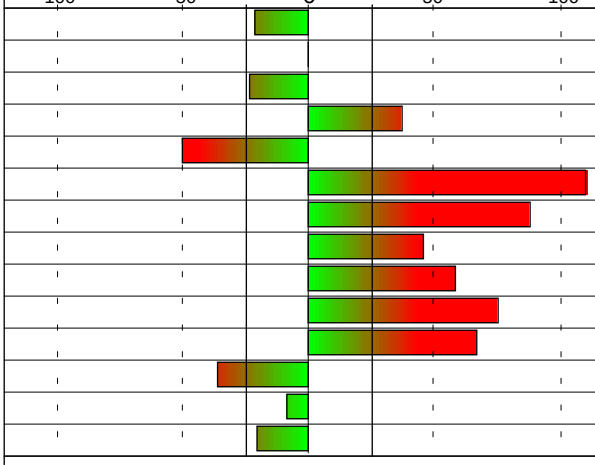
	% Status		Result	Low	High
Hippurate	114.62	H	**1101.10**	8.00	672.00
Pyruvate	100.48	H	**3.16**	0.00	2.10
Adipate	86.59	H	**6.01**	0.00	4.40
a-Ketoglutarate	79.73	H	**33.73**	0.00	26.00
Homovanillate	69.41	H	**8.12**	0.00	6.80
Tricarballylate	54.00	H	**1.56**	0.00	1.50
P-Hydroxyphenylacetate	52.70	H	**20.54**	0.00	20.00
a-Ketoisovalerate	50.00	H	**0.40**	0.00	0.40
Hydroxymethylglutarate	45.93	H	**5.66**	0.00	5.90
Pyroglutamate	35.78	H	**38.45**	11.00	43.00
Methylsuccinate	33.23	H	**2.58**	0.00	3.10
2-Hydroxyphenylacetate	32.86	H	**1.16**	0.00	1.40

Basic Status Alphabetic - Environmental Pollutants Exposure on

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

The % Status is the weighted deviation of the laboratory result relative to the range.



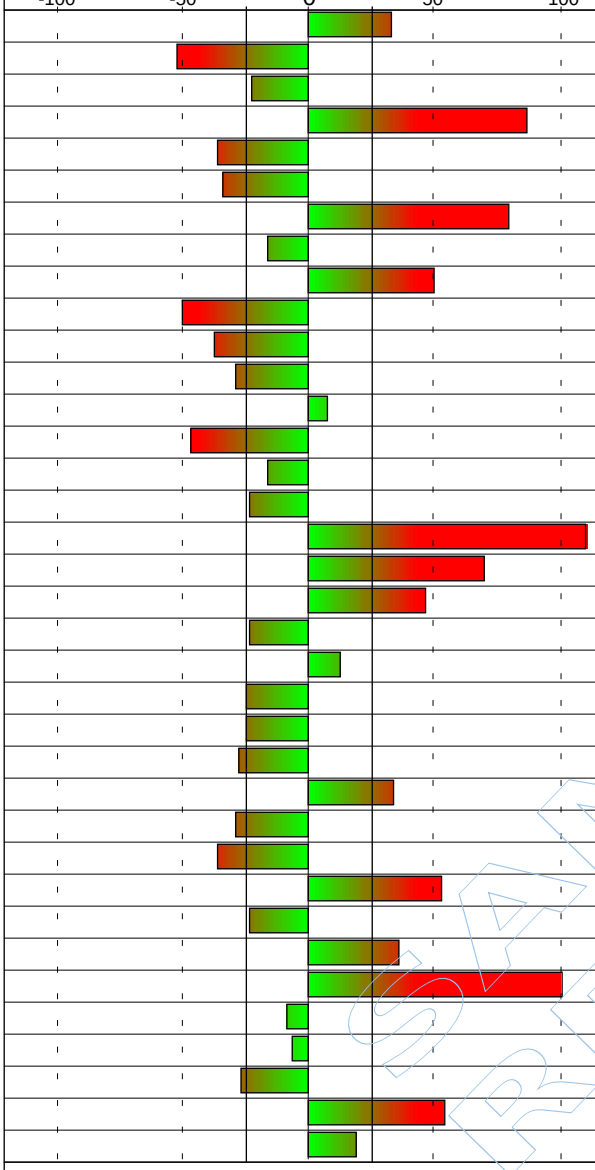
	% Status		Result	*Low*	*High*
2-Methylhippurate	-21.43		0.02	0.00	0.07
3,4-Dimethylhippurate	0.00		0.01	0.00	0.02
3-Methylhippurate	-23.33		0.04	0.00	0.15
a-Hydroxyisobutyrate	**36.50**	**H**	**6.92**	0.00	8.00
Benzoate	**-49.71**	**L**	**0.02**	0.00	7.00
Hippurate	**113.85**	**H**	**1101.10**	0.00	672.00
M + P	**87.50**	**H**	**0.88**	0.00	0.64
Mandelate	**45.00**	**H**	**0.38**	0.00	0.40
Monoethyl Phthalate	**57.69**	**H**	**0.14**	0.00	0.13
Phenylglyoxylate	**75.00**	**H**	**0.50**	0.00	0.40
Phthalate	**66.67**	**H**	**0.21**	0.00	0.18
p-Hydroxybenzoate	**-36.43**	**L**	**0.19**	0.00	1.40
Quinolinate	-8.33		3.00	0.00	7.20
t,t-Muconic Acid	-20.59		0.05	0.00	0.17
Total Status Deviation	**45.86**				
Total Status Skew	**23.03**				

Basic Status Alphabetic - Urine Organic Acids on

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

The % Status is the weighted deviation of the laboratory result relative to the range.



	% Status		Result	Low	High
2-Hydroxyphenylacetate	**32.86**	**H**	**1.16**	0.00	1.40
3-Indoleacetate	**-52.02**	**L**	**0.40**	0.60	10.50
5-Hydroxyindoleacetate	-22.13		4.70	1.30	13.50
Adipate	**86.59**	**H**	**6.01**	0.00	4.40
a-Hydroxybutyrate	**-36.00**	**L**	**0.21**	0.00	1.50
a-Keto-b-methylvalerate	**-33.81**	**L**	**0.34**	0.00	2.10
a-Ketoglutarate	**79.73**	**H**	**33.73**	0.00	26.00
a-Ketoisocaproate	-16.00		0.17	0.00	0.50
a-Ketoisovalerate	**50.00**	**H**	**0.40**	0.00	0.40
Benzoate	**-49.71**	**L**	**0.02**	0.00	7.00
b-Hydroxybutyrate	**-37.36**	**L**	**0.91**	0.00	7.20
b-Hydroxyisovalerate	**-28.84**	**L**	**2.37**	0.00	11.20
cis-Aconitate	7.54		37.40	0.00	65.00
Citrate	**-46.95**	**L**	**56.20**	34.30	751.30
Ethylmalonate	-16.00		1.87	0.00	5.50
Fumarate	-23.16		0.51	0.00	1.90
Hippurate	**114.62**	**H**	**1101.10**	8.00	672.00
Homovanillate	**69.41**	**H**	**8.12**	0.00	6.80
Hydroxymethylglutarate	**45.93**	**H**	**5.66**	0.00	5.90
Isocitrate	-23.10		39.30	28.00	70.00
Kynurenate	12.67		1.88	0.00	3.00
Lactate	-24.59		5.87	0.00	23.10
Malate	-24.00		1.04	0.00	4.00
Methylmalonate	**-27.50**	**L**	**0.36**	0.00	1.60
Methylsuccinate	**33.23**	**H**	**2.58**	0.00	3.10
Orotate	**-29.09**	**L**	**0.23**	0.00	1.10
p-Hydroxybenzoate	**-36.43**	**L**	**0.19**	0.00	1.40
P-Hydroxyphenylacetate	**52.70**	**H**	**20.54**	0.00	20.00
p-Hydroxyphenyllactate	-23.85		0.68	0.00	2.60
Pyroglutamate	**35.78**	**H**	**38.45**	11.00	43.00
Pyruvate	**100.48**	**H**	**3.16**	0.00	2.10
Quinolinate	-8.33		3.00	0.00	7.20
Suberate	-6.43		1.22	0.00	2.80
Succinate	**-26.27**	**L**	**5.34**	0.00	22.50
Tricarballylate	**54.00**	**H**	**1.56**	0.00	1.50
Vanilmandelate	19.36		3.26	0.00	4.70
Total Status Deviation	**39.86**				
Total Status Skew	**-2.88**				

Nutritional Support

The following supplements may help to balance your biochemistry. Consult your practitioner.

- ☐ **1 - L-Carnitine**
  See Nutrition Detail
- ☐ **1-B-Complex + Lipoic Acid**
  See Nutrition Detail
- ☐ **1-Pantothenic Acid (B5)**
  250 mg 2x daily
- ☐ **1-Probiotics**
  2 bil CFU 2x daily
- ☐ **1-Whey Protein (Cold Processed)**
  30 g
- ☐ **1-Amino Acid Complex**
  8-10 grams daily
- ☐ **1-Balanced Electrolyte**
  3x daily
- ☐ **1-Phthalate Reduction Protocol**
  See Nutrition Detail
- ☐ **1-Styrene Detoxification Protocol**
  See Nutrition Detail
- ☐ **2-Glycine**
  2x daily 1000 mg

Out-Of-Balance Panel Values

The following panels have a PSD of greater than 25% indicating need for further review. PSD is the Panel Status Deviation, or the average imbalance of that subset of results. The PSS is the Panel Status Skew, or the direction, negative (deficiency) or positive (excess), of that subset of results.

Panel Name	PSD	PSS
Plastic Sources	66.37%	66.37%
Paint and Solvents	57.71%	46.04%
Carbohydrate Metabolism	49.61%	0.63%
CAC Cycle Ratios	46.76%	-46.76%
Personal Care Products	45.34%	16.84%
Phthalates	44.23%	38.68%
Automotive Sources	44.19%	25.52%
Water Sources	40.86%	28.85%
Intestinal Dysbiosis	38.09%	-2.09%
Fatty Acid Metabolism	36.34%	21.39%
Energy Production	34.58%	-1.28%
Liver Detox Indicators	33.62%	-9.77%
BCAA Catabolism	33.27%	0.06%
B-Complex Markers	31.23%	-11.23%
Neurotransmitters	26.38%	14.20%

Lab Reported out-of-range Values

The following results are out-of-range (as reported by the lab), and should be carefully reviewed.

Hippurate (114.62%)

A high reading of this organic acid may be indicative of an overgrowth of intestinal microbiota due to the action of bacteria on phenylalanine, elevated levels of environmental toxins (typically solvents) or elevated ingestion of benzoic acid.

Drugs which may have an adverse affect:
Aspirin

Hippurate (113.85%)

A high reading of this organic acid may be indicative of an overgrowth of intestinal microbiota due to the action of bacteria on phenylalanine, elevated levels of environmental toxins (typically solvents) or elevated ingestion of benzoic acid.

Drugs which may have an adverse affect:
Aspirin

Pyruvate (100.48%)

Pyruvate is the end product of glucose metabolism. An elevated level may be indicative of a fundamental deficiency of B-complex vitamins and lipoic acid. High results are also seen in anorexia and other undereating disorders.

CA Cycle Return (-97.98%)

As the citric acid returns to the beginning through the conversion of Malate to Citrate through Oxalacetate, a low result may indicate an ammonia buildup due to an arginine deficiency.

M + P (87.50%)

Mandelate and Phenylglyoxalate individually are not as specific for styrene exposure as when the two combined are elevated. A high M + P level is a good marker for styrene exposure.

Adipate (86.59%)

An elevation of this organic acid may be indicative of a disorder of fatty acid oxidation. Clinical symptoms may include weakness, nausea, hypoglycemia, recurrent infections, and sweaty feet odor.

Drugs which may have an adverse affect:
Lithium Carbonate

a-Ketoglutarate (79.73%)

High levels of this organic acid may be indicative of poor amino acid metabolism or a need for both B-complex and lipoic acid.

Phenylglyoxylate (75.00%)

Phenylglyoxylic acid, along with Mandelate is a marker for styrene exposure. Primarily used in packaging, this petrochemical is made from a combination of benzene and ethylene. Styrene is also found in cigarette smoke making smokers more likely to suffer side-effects.

Some health effects include dizziness, lightheadedness, headache, drowsiness, nausea, impaired balance and manual dexterity along with difficulty concentrating and poor reaction time. Irritation of mucous membranes, dermatitis, nausea and fatigue are other potential effects of styrene exposure. Styrene is also known to be genotoxic and hepatotoxic. It has been suggested that this toxin may also increase the risk for a number of cancers including leukemia. In animal models, low levels can be extremely hepatotoxic to some while not to others. This suggests a genetic component to styrene excretion.

In order to help the body excrete styrene it is suggested to increase intake of glutathione as styrene oxides conjugate with this tripeptide.

Homovanillate (69.41%)

Elevated levels of homovanillate may be due to amino acid deficiencies, the use of L-Dopa as a treatment for Parkinson's disease, copper deficiency, cocaine or amphetamine use or chronic depletion of tyrosine. In a recently published article in EHP, heavy metals such as cadmium, lead, mercury and arsenic may also cause elevations of homovanillate.

Drugs which may have an adverse affect:
Aspirin

Phthalate (66.67%)

Phthalates are used in the manufacture of plastics to allow for flexibility and to soften resins. Not only that, but it is found in everything from makeup to detergents, shampoos to time-released pharmaceutical drugs. This toxin is a well known endocrine disruptor as well as causing neurological and developmental disorders. It can interfere with tryptophan metabolism resulting in an increase in quinolinic acid, a pro-inflammatory and neurotoxic compound. Phthalates have also been implicated in abnormal fetal development, especially in male fetuses. Recently, it has been linked to increased male waist circumference and insulin resistance.

Drugs which may have an adverse affect:
Time-Released Meds

CA Cycle Phase 6 (-60.12%)

The last phase of the citric acid cycle, this stage marks the conversion of Fumarate into Malate. When the ratio is low, this may signify that the body is not refilling its losses along the entire cycle. Supplementing with a broad spectrum amino acid along with niacin may help restore balance.

Monoethyl Phthalate (57.69%)

Phthalates are used in the manufacture of plastics to allow for flexibility and to soften resins. Not only that, but it is found in everything from makeup to detergents, shampoos to time-released pharmaceutical drugs.

This toxin is a well known endocrine disruptor as well as causing neurological and developmental disorders. It can interfere with tryptophan metabolism resulting in an increase in quinolinic acid, a pro-inflammatory and neurotoxic compound. Phthalates have also been implicated in abnormal fetal development, especially in male fetuses. Recently, it has been linked to increased male waist circumference and insulin resistance.

Drugs which may have an adverse affect:
Time-Released Meds

Tricarballylate (54.00%)

Elevated levels may be due to an overgrowth of intestinal bacteria. This organic acid binds very tightly to magnesium, possibly zinc and calcium and may induce a deficiency in these important minerals. The bacterium that produces this element is also very fast growing and may cause numerous vitamin and mineral deficiencies. As it may interfere with carbohydrate absorption, a diet low in carbohydrates is suggested.

P-Hydroxyphenylacetate (52.70%)

Elevated levels may be indicative of overgrowth of intestinal bacterial or protozoa especially Giardia lamblia, Clostridium difficile, Proteus vulgaris ileal resection with blind loop, and other small intestine infestations of anaerobic bacteria. Other possibilities is that these results are due to malabsorption of tyrosine due to HCL deficiency, overuse of antibiotics, or lactose intolerance.

3-Indoleacetate (-52.02%)

No known health issues are related to low levels of 3-Indoleacetate.

a-Ketoisovalerate (50.00%)

This organic acid may be elevated due to poor amino acid metabolism. Supplementation with a B complex may be necessary as well as additional intake of thiamine (B1)

Nutrition - Detail

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

Nutritional and herbal information contained in this report is based upon research related to imbalances in your chemistry. The recommendations are based upon the information provided, without interpretation. This must be done with the help of your qualified health care professional.

1 - L-Carnitine See Nutrition Detail

Rationale

Carnitine is sometimes considered a non-essential amino acid which is synthesized in the liver and kidneys from lysine. methionine and other nutrients. It is critical in the metabolism of fat and transport of long-chain essential fatty acids as well as being cardiac protective. Biotin is an important addition anytime you take carnitine to avoid stimulating gluconeogenesis.
Adults - 1-2 g daily
Children - 500 mg daily

Decreased	Normal	Increased
	Suberate Ethylmalonate	Adipate

1-Amino Acid Complex 8-10 grams daily

Imbalanced levels of these organic acids may indicate poor amino acid levels. The addition of a balanced amino acid supplement is helpful in resolving this deficiency.

Decreased	Normal	Increased
Citrate Succinate		

1-B-Complex + Lipoic Acid See Nutrition Detail

B complex vitamins are involved in a broad spectrum of cell metabolic deficiencies as well as fatty acid utilization.
ALPHA LIPOIC ACID
Lipoic acid helps recycle antioxidants and extends their antioxidant life.
Important co-enzyme for energy metabolism.
Adults
1 - B-complex twice daily
ALA - 100 mg 2x daily
Children
1 - B-complex daily
50 mg daily

Decreased	Normal	Increased
		Pyruvate a-Ketoglutarate

1-Balanced Electrolyte 3x daily

The main electrolytes in the human body are sodium, potassium, phosphorus, calcium, chloride, magnesium and bicarbonate. During illness, the equilibrium present in healthy individuals, is disturbed. A well balanced formula is helpful in restoring a state of equilibrium. In many cases of intestinal dysbiosis, alkalizing the system with electrolytes may aid in dislodging the microbiota from the gut wall.

Decreased	Normal	Increased
		Tricarballylate

1-Pantothenic Acid (B5) 250 mg 2x daily

Vital in enzymatic reactions in fatty acid and carbohydrate metabolism, as well as gluconeogenesis, synthesis of sterols, steroid hormones and porphyrins. As CoA, it functions as a carrier of acyl groups. It also plays a central role in cellular proteins, impacting their activity and structure. Pantothenic acid may be helpful in lowering pyruvate.

Decreased	Normal	Increased
		Pyruvate

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1-Phthalate Reduction Protocol See Nutrition Detail

Rationale

Phthalates are ubiquitous chemicals found wherever plastics are found. They are powerful endocrine disruptors as well as potentially damaging to developing fetuses. Avoidance of plastics while very difficult is an important first step in lowering body burden. Never microwave or heat food in a plastic container. Improving both phase I and phase II detoxification is also critical.

Recommendations:
Adults
Amino Acids - 8-10 grams daily
Broad Spectrum Antioxidants - 2x daily
Increased Fluid Intake preferably with an electrolyte added
Avoid Salicylates
VItamin E - 400 IU 3x weekly (mixed tocopherols)
Magnesium - 200 mg daily
Zinc - 50 mg daily
Children
Amino Acids - 4-5 g daily
Broad Spectrum Antioxidants - 1x daily
Increased Fluid Intake preferably with an electrolyte added
Avoid Salicylates
VItamin E - 400 IU 1x weekly (mixed tocopherols)
Magnesium - 200 mg daily
Zinc - 25 mg daily

Decreased	Normal	Increased
		Phthalate
		Monoethyl Phthalate

1-Probiotics 2 bil CFU 2x daily

A comprehensive probiotic protocol has shown promise in relieving intestinal bacteria and parasitic infections. It is important to use a broad spectrum of probiotic organisms with a high concentration, preferably 20-25 billion of live organisms per capsule.

Decreased	Normal	Increased
		Tricarballylate

1-Styrene Detoxification Protocol See Nutrition Detail

Styrene detoxification requires an increased level of glutathione. In order to effectively increase glutathione levels it is necessary to supply both the necessary amino acids (cysteine, glutamic acid and glycine) as well as the nutrients (pyridoxine, riboflavin and folic acid) to make the conversion.
Adult
Broad Spectrum Amino Acid - 8-10 grams daily
Glycine - 500 mg 2x daily
N-acetyl-cysteine - 500 mg 2x daily
B-complex - 2x daily
Vitamin E - 400 IU 3x weekly (mixed tocopherols)
Vitamin C - 1000 mg 2x daily
Selenium - 200 mcg
Children
Broad Spectrum Amino Acid - 4-5 grams
Glycine - 500 mg
N-acetyl-cysteine - 250 mg
B-complex - 1x daily
Vitamin E - 200 IU once daily (mixed tocopherols)
Vitamin C - 500 mg 1 time daily

Decreased	Normal	Increased
		M + P
		Mandelate
		Phenylglyoxylate

1-Whey Protein (Cold Processed) 30 g

High quality whey protein is one of the most effective means of boosting glutathione levels which seem to be deficient in this case. The whey should also contain an array of vitamins (especially vitamin C) and minerals along with immunoglobulins, glycine and N-acetyl cysteine.
For adults, at least one serving full serving and for children one-half a serving per day is recommended.

Decreased	Normal	Increased
a-Hydroxybutyrate		Pyroglutamate

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2-Glycine 2x daily 1000 mg

Glycine is an important amino acid and is necessary in phase II detoxification as it is a component of hippurate through its binding with benzoate.

Rationale

Decreased	Normal	Increased
Benzoate		Hippurate

Drug Interactions

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

Drugs listed below tend to further aggravate elements of blood chemistry that are out of range (H or L). The (#) after each drug denotes the number of times that drug is flagged as being potentially harmful.

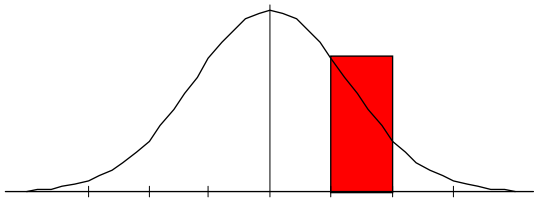
Acetaminophen Time-Released Meds(2)	Aspirin(3)	Lithium Carbonate	Lovastatin

Automotive Sources

PSD: 44.19
PSS: 25.52

2-Methylhippurate, 3-Methylhippurate, Mandelate[H], Phenylglyoxylate[H], M + P[H], t,t-Muconic Acid, a-Hydroxyisobutyrate[H].

This panel ascertains the level of automotive-sourced toxins within your cells. The leading source is car exhaust. Other sources include: jogging on busy streets next to traffic, commuting in heavy traffic, and living in large urban areas. This profile may indicate a high level of intracellular toxins. Strongly consider an appropriate detoxification protocol.

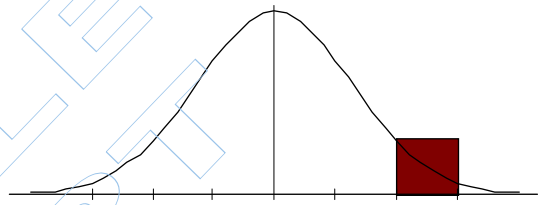


Paint and Solvents

PSD: 57.71
PSS: 46.04

3-Methylhippurate, Mandelate[H], Phenylglyoxylate[H], M + P[H].

This panel ascertains the level of paint and solvent toxins within your cells. Paints and solvents are often found with styrene and xylene. Airing out a newly painted house is advisable. When using paints and solvents, always ensure the work space is well-ventilated and wear an appropriate mask. This profile likely indicates a high level of paint and solvent toxins within your cells. Strongly consider an appropriate detoxification protocol.

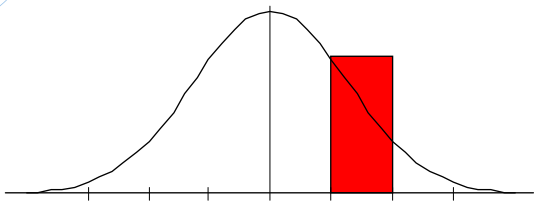


Personal Care Products

PSD: 45.34
PSS: 16.84

Phthalate[H], Monoethyl Phthalate[H], p-Hydroxybenzoate[L], t,t-Muconic Acid.

This panel ascertains the intracellular toxins from cosmetic sources. Common toxins include: parabens, phthalates and benzene derivatives. To learn more about this topic, visit the Environmental Working Group, (www.ewg.org) and read their report "Skin Deep." This profile likely indicates high cosmetic toxin levels within your cells. Strongly consider appropriate detoxification protocol.

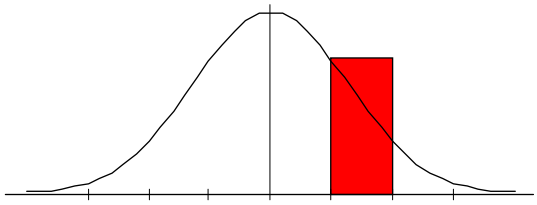


Phthalates

PSD: 44.23
PSS: 38.68

Phthalate[H], Monoethyl Phthalate[H], Quinolinate.

Phthalates are a commonly found in everyday things including: plastic items, scented items like air fresheners & candles, and personal care products. Phthalates disrupt the endocrine system and lowers testosterone in fetuses. This profile suggests a high exposure. This can cause weight gain, blood sugar control issues, and problems with pregnancies, etc. Highly consider an appropriate detoxification protocol.

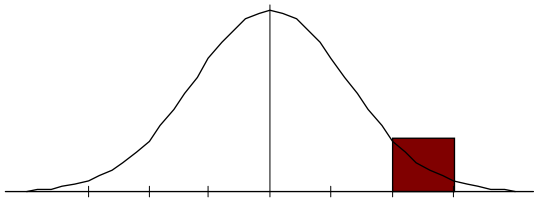


Plastic Sources

Phthalate[H], Monoethyl Phthalate[H], Mandelate[H], Phenylglyoxylate[H], M + P[H].

PSD: 66.37
PSS: 66.37

Plastics are made with styrene and phthalates. This panel ascertains the level of intracellular toxins sourced from plastics. Common sources include: microwaving in plastic containers, drinking from plastic bottles, drinking hot liquids from styrofoam cups, etc. This profile likely indicates a high level of toxins within your cells. Strongly consider an appropriate detoxification protocol.

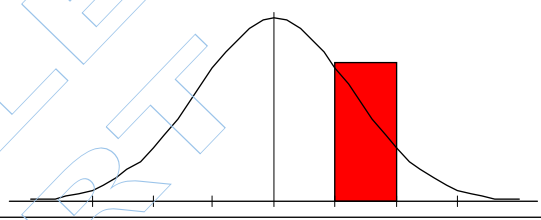


Water Sources

t,t-Muconic Acid, Mandelate[H], Phenylglyoxylate[H], M + P[H], 2-Methylhippurate, 3,4-Dimethylhippurate, a-Hydroxyisobutyrate[H].

PSD: 40.86
PSS: 28.85

This panel ascertains the level of intracellular toxins sourced from water. Research shows most water supplies worldwide are tainted with a number of petrochemicals including: trimethylbenzene, toluene, styrene, and benzene. This profile likely shows a high level of intracellular toxins. Highly consider an appropriate detoxification protocol. Also consider testing your water supply - even if it is a well.

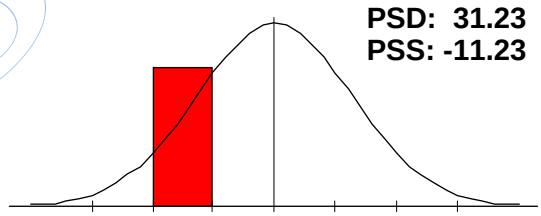


B-Complex Markers

b-Hydroxyisovalerate[L], a-Ketoisovalerate[H], a-Ketoisocaproate, a-Keto-b-methylvalerate[L], Methylmalonate[L].

PSD: 31.23
PSS: -11.23

This panel assesses adequate intake of B-complex vitamins. This profile may indicate a poor amino acid metabolism or a lack of quality protein in the diet.

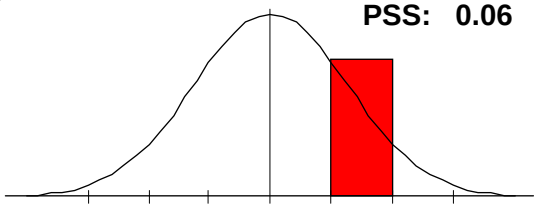


BCAA Catabolism

a-Ketoisovalerate[H], a-Ketoisocaproate, a-Keto-b-methylvalerate[L].

PSD: 33.27
PSS: 0.06

BCAA's are essential in building muscle and you can only get them from your diet or supplements. This panel assess your BCAA levels and how they're being used. This profile may indicate a lack of B-Complex nutrients necessary to metabolize proteins properly. Review your B-complex markers panel and your Supplement List Explanation.

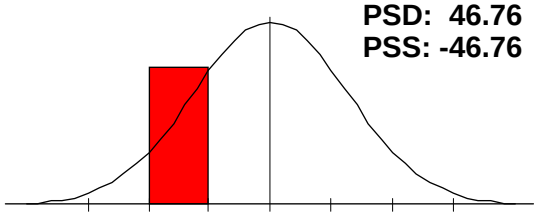


CAC Cycle Ratios

CA Cycle Phase 1[L], CA Cycle Phase 2, CA Cycle Phase 3[L], CA Cycle Phase 4[L], CA Cycle Phase 5[L], CA Cycle Phase 6[L], CA Cycle Return[L.

PSD: 46.76
PSS: -46.76

This panel reviews cellular energy producing cycles to maintain health and weight. This profile may indicate poor energy production and/or vitamin, mineral and amino acid deficiencies.

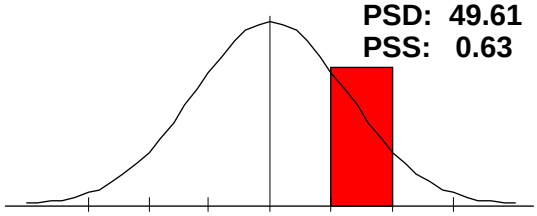


Carbohydrate Metabolism

Lactate, Pyruvate[H], a-Hydroxybutyrate[L], b-Hydroxybutyrate[L].

This panel assesses your body's ability to metabolize dietary carbohydrates. This profile suggests impaired carbohydrate metabolism. Symptoms include: brain function disorders, fatigue, weight gain, and chronic diseases. Review your Supplement List Explanation.

PSD: 49.61
PSS: 0.63

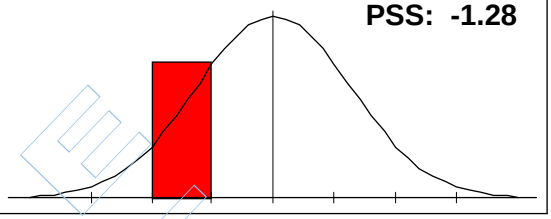


Energy Production

Citrate[L], cis-Aconitate, Isocitrate, a-Ketoglutarate[H], Succinate[L], Fumarate, Malate, Hydroxymethylglutarate[H].

This panel reviews cellular energy producing cycles to maintain health and weight. This profile may indicate an amino acid deficiency. Low readings are typically desirable, but if the CAC Cycle Ratios are abnormal, consider adding a broad spectrum amino acid supplement.

PSD: 34.58
PSS: -1.28

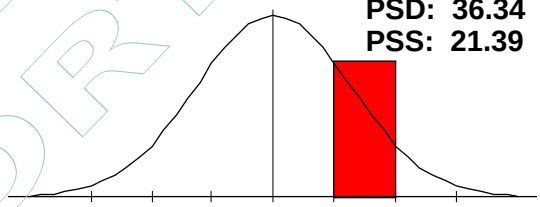


Fatty Acid Metabolism

Adipate[H], Suberate, Ethylmalonate.

This panel assesses how fats are being broken down and utilized by the body. This profile may indicate a need for additional carnitine and riboflavin (B2) supplementation. Review your Supplement List Explanation.

PSD: 36.34
PSS: 21.39

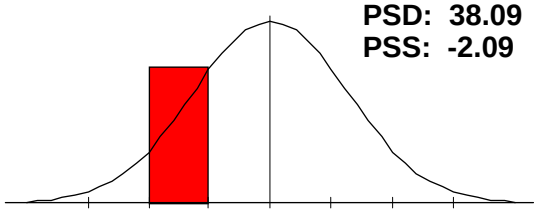


Intestinal Dysbiosis

p-Hydroxyphenyllactate, Tricarballylate[H], p-Hydroxybenzoate[L].

Dysbyosis is an overgrowth of bad bacteria in the gut. It is indicative of gut health. This profile suggests you have good gut health

PSD: 38.09
PSS: -2.09

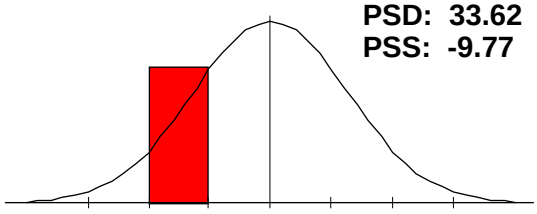


Liver Detox Indicators

Orotate[L], Pyroglutamate[H], a-Hydroxybutyrate[L].

This panel assesses how well your liver removes toxins from your system. This profile may indicate the liver is inefficient in its detoxification process.

PSD: 33.62
PSS: -9.77

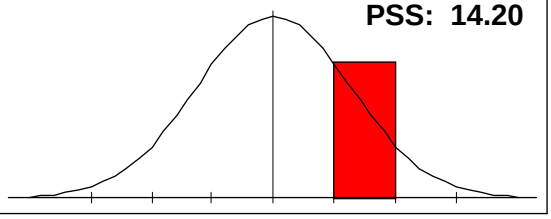


Neurotransmitters

Vanilmandelate, Homovanillate[H], 5-Hydroxyindoleacetate, Kynurenate, Quinolinate.

Neurotransmitters are chemicals the brain uses to make the entire neurological system function - including all body functions. This panel assesses neurotransmitter production. This profile may be caused by the use of SSRI's. This may lead to fatigue, depression, or anxiety.

PSD: 26.38
PSS: 14.20



Clinical Correlation

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

This report "MATCHES" clinical observations with the lab test. Elements shown, normal and abnormal, tend to characterize the observation. Highlighted elements are those reported to "MATCH" the characteristics of the clinical observation. Others are NOT matches but are elements in the observation.

No disease pattern matches > 66.0%

Comparison Progress Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

A "+" change is toward optimal % Status of zero. A "-" change is away from optimal % Status of zero.

Status % on:	8/25/2019		1/5/2020		+/- change
t,t-Muconic Acid	**226.47**	**H**	-20.59		+ 205.88
Mandelate	**137.50**	**H**	**45.00**	**H**	**+ 92.50**
Hippurate	**204.52**	**H**	**113.85**	**H**	**+ 90.67**
3-Methylhippurate	**110.00**	**H**	-23.33		+ 86.67
M + P	**153.13**	**H**	**87.50**	**H**	**+ 65.63**
2-Methylhippurate	**78.57**	**H**	-21.43		+ 57.14
3,4-Dimethylhippurate	**50.00**	**H**	0.00		+ 50.00
a-Hydroxyisobutyrate	**78.63**	**H**	**36.50**	**H**	**+ 42.13**
Benzoate	-24.00		**-49.71**	**L**	**- 25.71**

Comparison Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

The arrow's length is proportional to change. Left to right is increase. Right to left is decrease.
Green is improvement. Red is decline.

	+/-	Status % on:	8/25/2019		1/5/2020	
-21.43 → **78.57**	+	2-Methylhippurate	**78.57**	**H**	-21.43	
0.00 → **50.00**	+	3,4-Dimethylhippurate	**50.00**	**H**	0.00	
-23.33 → **110.00**	+	3-Methylhippurate	**110.00**	**H**	-23.33	
36.50 → **78.63**	+	a-Hydroxyisobutyrate	**78.63**	**H**	**36.50**	**H**
-49.71 ← -24.00	-	Benzoate	-24.00		**-49.71**	**L**
113.85 → **204.52**	+	Hippurate	**204.52**	**H**	**113.85**	**H**
87.50 → **153.13**	+	M + P	**153.13**	**H**	**87.50**	**H**
45.00 → **137.50**	+	Mandelate	**137.50**	**H**	**45.00**	**H**
		Monoethyl Phthalate	**57.69**	**H**	**57.69**	**H**
75.00 ← **90.00**	+	Phenylglyoxylate	**90.00**	**H**	**75.00**	**H**
		Phthalate	**61.11**	**H**	**66.67**	**H**
-36.43 ← -12.14	-	p-Hydroxybenzoate	-12.14		**-36.43**	**L**
		Quinolinate	-5.56		-8.33	
-20.59 → **226.47**	+	t,t-Muconic Acid	**226.47**	**H**	-20.59	
		Total Status Deviation	**92.09**		**45.86**	
		Total Status Skew	**86.14**		**23.03**	

Comparison Progress Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

A "+" change is toward optimal % Status of zero. A "-" change is away from optimal % Status of zero.

Status % on:	8/25/2019		1/5/2020		+/- change
Adipate	**1367.05**	**H**	**86.59**	**H**	**+1280.45**
5-Hydroxyindoleacetate	**759.84**	**H**	-22.13		+ 737.70
Hippurate	**206.39**	**H**	**114.62**	**H**	**+ 91.76**
2-Hydroxyphenylacetate	**107.14**	**H**	**32.86**	**H**	**+ 74.29**
Suberate	**71.07**	**H**	-6.43		+ 64.64
cis-Aconitate	**37.38**	**H**	7.54		+ 29.85
a-Ketoglutarate	-3.00		**79.73**	**H**	**- 76.73**
Pyruvate	**41.90**	**H**	**100.48**	**H**	**- 58.57**
Tricarballylate	5.33		**54.00**	**H**	**- 48.67**
CA Cycle Return	**-58.11**	**L**	**-97.98**	**L**	**- 39.87**
CA Cycle Phase 4	-9.37		**-46.04**	**L**	**- 36.67**
Citrate	-11.87		**-46.95**	**L**	**- 35.08**
CA Cycle Phase 1	4.17		**-34.97**	**L**	**- 30.80**
a-Ketoisovalerate	-20.00		**50.00**	**H**	**- 30.00**
CA Cycle Phase 5	2.26		**-29.06**	**L**	**- 26.80**
Methylmalonate	1.25		**-27.50**	**L**	**- 26.25**
Benzoate	-24.00		**-49.71**	**L**	**- 25.71**
Homovanillate	**44.12**	**H**	**69.41**	**H**	**- 25.29**
b-Hydroxyisovalerate	-3.66		**-28.84**	**L**	**- 25.18**

Comparison Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

The arrow's length is proportional to change. Left to right is increase. Right to left is decrease.
Green is improvement. Red is decline.

	+/-	Status % on:	8/25/2019		1/5/2020	
32.86 ← **107.14**	+	2-Hydroxyphenylacetate	**107.14**	**H**	**32.86**	**H**
-52.02 ← **-40.61**	-	3-Indoleacetate	**-40.61**	**L**	**-52.02**	**L**
-22.13 ← **759.84**	+	5-Hydroxyindoleacetate	**759.84**	**H**	-22.13	
86.59 ← **1367.05**	+	Adipate	**1367.05**	**H**	**86.59**	**H**
-50.00 → **-36.00**	+	a-Hydroxybutyrate	**-50.00**	**L**	**-36.00**	**L**
		a-Keto-b-methylvalerate	**-38.57**	**L**	**-33.81**	**L**
-3.00 → **79.73**	-	a-Ketoglutarate	-3.00		**79.73**	**H**
		a-Ketoisocaproate	-10.00		-16.00	
-20.00 → **50.00**	-	a-Ketoisovalerate	-20.00		**50.00**	**H**
-49.71 ← -24.00	-	Benzoate	-24.00		**-49.71**	**L**
		b-Hydroxybutyrate	**-39.86**	**L**	**-37.36**	**L**
-28.84 ← -3.66	-	b-Hydroxyisovalerate	-3.66		**-28.84**	**L**
7.54 ← **37.38**	+	cis-Aconitate	**37.38**	**H**	7.54	
-46.95 ← -11.87	-	Citrate	-11.87		**-46.95**	**L**
-16.00 ← -8.00	-	Ethylmalonate	-8.00		-16.00	
-23.16 ← -10.00	-	Fumarate	-10.00		-23.16	
114.62 ← **206.39**	+	Hippurate	**206.39**	**H**	**114.62**	**H**
44.12 → **69.41**	-	Homovanillate	**44.12**	**H**	**69.41**	**H**
45.93 ← **53.56**	+	Hydroxymethylglutarate	**53.56**	**H**	**45.93**	**H**
-23.10 ← **42.14**	+	Isocitrate	**42.14**	**H**	-23.10	
		Kynurenate	15.33		12.67	
		Lactate	**-26.80**	**L**	-24.59	
-24.00 ← 7.50	-	Malate	7.50		-24.00	
-27.50 ← 1.25	-	Methylmalonate	1.25		**-27.50**	**L**
10.65 → **33.23**	-	Methylsuccinate	10.65		**33.23**	**H**
-29.09 ← -9.09	-	Orotate	-9.09		**-29.09**	**L**
-36.43 ← -12.14	-	p-Hydroxybenzoate	-12.14		**-36.43**	**L**
44.25 → **52.70**	-	P-Hydroxyphenylacetate	**44.25**	**H**	**52.70**	**H**
		p-Hydroxyphenyllactate	-21.15		-23.85	
13.16 → **35.78**	-	Pyroglutamate	13.16		**35.78**	**H**
41.90 → **100.48**	-	Pyruvate	**41.90**	**H**	**100.48**	**H**
		Quinolinate	-5.56		-8.33	
-6.43 ← **71.07**	+	Suberate	**71.07**	**H**	-6.43	
-26.27 ← **38.27**	+	Succinate	**38.27**	**H**	**-26.27**	**L**
5.33 → **54.00**	-	Tricarballylate	5.33		**54.00**	**H**
7.02 → 19.36	-	Vanilmandelate	7.02		19.36	
		Total Status Deviation	**78.62**		**39.86**	
		Total Status Skew	**56.18**		**-2.88**	

Panel/Subset Comparison Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

Automotive Sources	8/25/2019		1/5/2020		+/-
2-Methylhippurate	**78.57**	**H**	-21.43		+
3-Methylhippurate	**110.00**	**H**	-23.33		+
Mandelate	**137.50**	**H**	**45.00**	**H**	+
Phenylglyoxylate	**90.00**	**H**	**75.00**	**H**	+
M + P	**153.13**	**H**	**87.50**	**H**	+
t,t-Muconic Acid	**226.47**	**H**	-20.59		+
a-Hydroxyisobutyrate	**78.63**	**H**	**36.50**	**H**	+
PSS / PSD	124.90 / 124.90		25.52 / 44.19		

Paint and Solvents	8/25/2019		1/5/2020		+/-
3-Methylhippurate	**110.00**	**H**	-23.33		+
Mandelate	**137.50**	**H**	**45.00**	**H**	+
Phenylglyoxylate	**90.00**	**H**	**75.00**	**H**	+
M + P	**153.13**	**H**	**87.50**	**H**	+
PSS / PSD	122.66 / 122.66		46.04 / 57.71		

Personal Care Products	8/25/2019		1/5/2020		+/-
Phthalate	**61.11**	**H**	**66.67**	**H**	
Monoethyl Phthalate	**57.69**	**H**	**57.69**	**H**	
p-Hydroxybenzoate	-12.14		**-36.43**	**L**	-
t,t-Muconic Acid	**226.47**	**H**	-20.59		+
PSS / PSD	83.28 / 89.35		16.84 / 45.34		

Phthalates	8/25/2019		1/5/2020		+/-
Phthalate	**61.11**	**H**	**66.67**	**H**	
Monoethyl Phthalate	**57.69**	**H**	**57.69**	**H**	
Quinolinate	-5.56		-8.33		
PSS / PSD	37.75 / 41.45		38.68 / 44.23		

Plastic Sources	8/25/2019		1/5/2020		+/-
Phthalate	**61.11**	**H**	**66.67**	**H**	
Monoethyl Phthalate	**57.69**	**H**	**57.69**	**H**	
Mandelate	**137.50**	**H**	**45.00**	**H**	+
Phenylglyoxylate	**90.00**	**H**	**75.00**	**H**	+
M + P	**153.13**	**H**	**87.50**	**H**	+
PSS / PSD	99.89 / 99.89		66.37 / 66.37		

Water Sources	8/25/2019		1/5/2020		+/-
t,t-Muconic Acid	**226.47**	**H**	-20.59		+
Mandelate	**137.50**	**H**	**45.00**	**H**	+
Phenylglyoxylate	**90.00**	**H**	**75.00**	**H**	+
M + P	**153.13**	**H**	**87.50**	**H**	+
2-Methylhippurate	**78.57**	**H**	-21.43		+
3,4-Dimethylhippurate	**50.00**	**H**	0.00		+
a-Hydroxyisobutyrate	**78.63**	**H**	**36.50**	**H**	+
PSS / PSD	116.33 / 116.33		28.85 / 40.86		

Panel/Subset Comparison Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

B-Complex Markers	8/25/2019		1/5/2020		+/-
b-Hydroxyisovalerate	-3.66		**-28.84**	**L**	-
a-Ketoisovalerate	-20.00		**50.00**	**H**	-
a-Ketoisocaproate	-10.00		-16.00		
a-Keto-b-methylvalerate	**-38.57**	**L**	**-33.81**	**L**	
Methylmalonate	1.25		**-27.50**	**L**	-
PSS / PSD	-14.20 / 14.70		-11.23 / 31.23		

BCAA Catabolism	8/25/2019		1/5/2020		+/-
a-Ketoisovalerate	-20.00		**50.00**	**H**	-
a-Ketoisocaproate	-10.00		-16.00		
a-Keto-b-methylvalerate	**-38.57**	**L**	**-33.81**	**L**	
PSS / PSD	-22.86 / 22.86		0.06 / 33.27		

CAC Cycle Ratios	8/25/2019		1/5/2020		+/-
CA Cycle Phase 1	4.17		**-34.97**	**L**	-
CA Cycle Phase 2	-20.64		-23.73		
CA Cycle Phase 3	18.23		**-35.44**	**L**	-
CA Cycle Phase 4	-9.37		**-46.04**	**L**	-
CA Cycle Phase 5	2.26		**-29.06**	**L**	-
CA Cycle Phase 6	**-60.04**	**L**	**-60.12**	**L**	
CA Cycle Return	**-58.11**	**L**	**-97.98**	**L**	-
PSS / PSD	-17.64 / 24.69		-46.76 / 46.76		

Carbohydrate Metabolism	8/25/2019		1/5/2020		+/-
Lactate	**-26.80**	**L**	-24.59		
Pyruvate	**41.90**	**H**	**100.48**	**H**	-
a-Hydroxybutyrate	**-50.00**	**L**	**-36.00**	**L**	+
b-Hydroxybutyrate	**-39.86**	**L**	**-37.36**	**L**	
PSS / PSD	-18.69 / 39.64		0.63 / 49.61		

Energy Production	8/25/2019		1/5/2020		+/-
Citrate	-11.87		**-46.95**	**L**	-
cis-Aconitate	**37.38**	**H**	7.54		+
Isocitrate	**42.14**	**H**	-23.10		+
a-Ketoglutarate	-3.00		**79.73**	**H**	-
Succinate	**38.27**	**H**	**-26.27**	**L**	+
Fumarate	-10.00		-23.16		-
Malate	7.50		-24.00		-
Hydroxymethylglutarate	**53.56**	**H**	**45.93**	**H**	+
PSS / PSD	19.25 / 25.47		-1.28 / 34.58		

Fatty Acid Metabolism	8/25/2019		1/5/2020		+/-
Adipate	**1367.05**	**H**	**86.59**	**H**	+
Suberate	**71.07**	**H**	-6.43		+
Ethylmalonate	-8.00		-16.00		-
PSS / PSD	476.71 / 482.04		21.39 / 36.34		

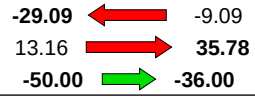
Panel/Subset Comparison Report

Organic Acids & Environmental Pollutants Date:

/ Age: ( )

Intestinal Dysbiosis	8/25/2019		1/5/2020		+/-
p-Hydroxyphenyllactate	-21.15		-23.85		
Tricarballylate	5.33		**54.00**	**H**	-
p-Hydroxybenzoate	-12.14		**-36.43**	**L**	-
PSS / PSD	-9.32 / 12.88		-2.09 / 38.09		

Liver Detox Indicators	8/25/2019		1/5/2020		+/-
Orotate	-9.09		**-29.09**	**L**	-
Pyroglutamate	13.16		**35.78**	**H**	-
a-Hydroxybutyrate	**-50.00**	**L**	**-36.00**	**L**	+
PSS / PSD	-15.31 / 24.08		-9.77 / 33.62		



Neurotransmitters	8/25/2019		1/5/2020		+/-
Vanilmandelate	7.02		19.36		-
Homovanillate	**44.12**	**H**	**69.41**	**H**	-
5-Hydroxyindoleacetate	**759.84**	**H**	-22.13		+
Kynurenate	15.33		12.67		
Quinolinate	-5.56		-8.33		
PSS / PSD	164.15 / 166.37		14.20 / 26.38