CELLMATE™ WELLNESS SYSTEMS

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FRANK

Test date: 3/11/2003
(accession: A0303120090)
Entered: 3/24/2003

Next Test Due: 9/10/2003

CellMate™ Amino Acid & Organic Acid Report

Practitioner

Printed on Thursday, April 3, 2003 for:

If there is a problem with this report, please contact us as soon as possible at: (775) 832-8485 or Fax (775) 832-8488

Basic Status Report (High/Low)

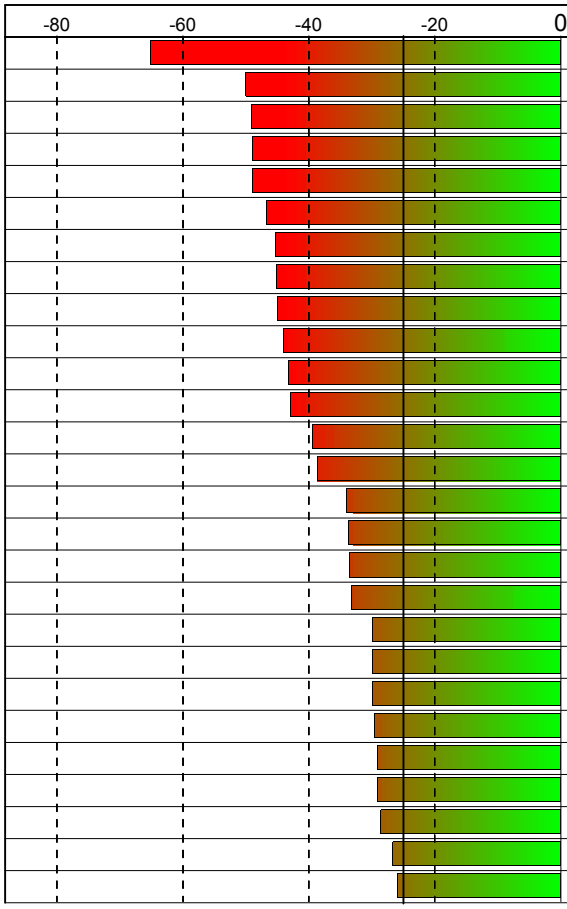
FRANK **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

Client ID:548664859 (9732)

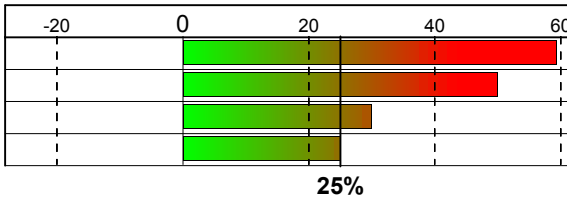
The % Status is the weighted deviation of the laboratory result.

Low Results



	% Status		Result	*Low*	*High*
Glycine - P	-65.11	L	**191.00**	225.00	450.00
Aspartic Acid - P	-50.00	L	**6.00**	6.00	30.00
Serine - P	-49.17	L	**91.00**	90.00	210.00
Anserine - P	-49.00	L	**0.01**	0.00	1.00
Carnosine - P	-49.00	L	**0.01**	0.00	1.00
Threonine - P	-46.67	L	**105.00**	100.00	250.00
Asparagine - P	-45.29	L	**49.00**	45.00	130.00
Glutamine - P	-45.11	L	**622.00**	600.00	1050.00
1-Methylhistidine - P	-45.00	L	**1.00**	0.00	20.00
Taurine - P	-44.00	L	**62.00**	50.00	250.00
Glutamic Acid - P	-43.33	L	**52.00**	45.00	150.00
Histidine - P	-42.86	L	**75.00**	70.00	140.00
Phenylalanine - P	-39.47	L	**55.00**	45.00	140.00
Ornithine - P	-38.67	L	**67.00**	50.00	200.00
Methionine - P	-34.00	L	**29.00**	25.00	50.00
Proline - P	-33.70	L	**174.00**	130.00	400.00
Arginine - P	-33.64	L	**68.00**	50.00	160.00
a-Amino-N-Butyric Acid - P	-33.33	L	**15.00**	10.00	40.00
b-Alanine - P	-30.00	L	**1.00**	0.00	5.00
Gamma-aminobutyric Acid-P	-30.00	L	**1.00**	0.00	5.00
Sarcosine - P	-30.00	L	**1.00**	0.00	5.00
Valine - P	-29.60	L	**221.00**	170.00	420.00
Alanine - P	-29.14	L	**323.00**	250.00	600.00
Isoleucine - P	-29.09	L	**73.00**	50.00	160.00
Tyrosine - P	-28.57	L	**65.00**	50.00	120.00
Hydroxyproline - P	-26.67	L	**7.00**	0.00	30.00
Lysine - P	-26.00	L	**186.00**	150.00	300.00

High Results



	% Status		Result	*Low*	*High*
Collagen Related AA	59.33	H	**174.00**	10.00	160.00
Cystathionine - P	50.00	H	**4.00**	0.00	4.00
3-Methylhistidine - P	30.00	H	**4.00**	0.00	5.00
Ethanolamine - P	25.00	H	**6.00**	0.00	8.00

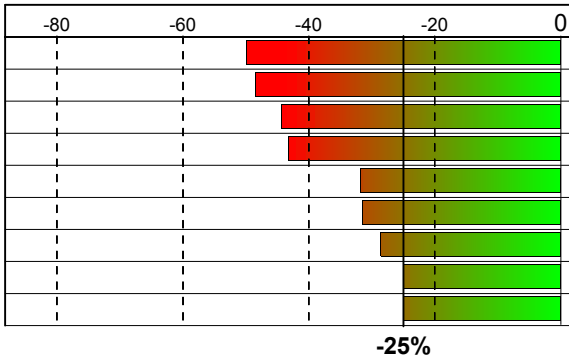
Basic Status Report (High/Low)

FRANK **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

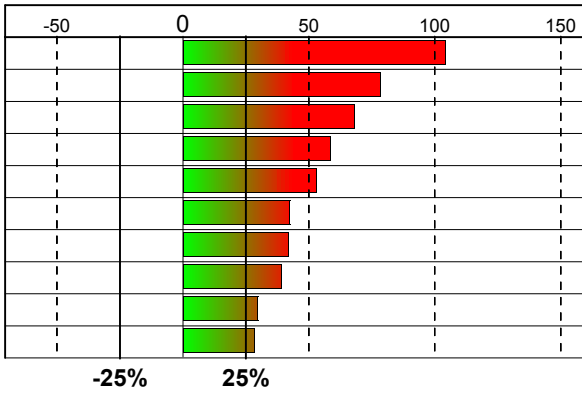
The % Status is the weighted deviation of the laboratory result.

Low Results



	% Status		Result	Low	High
Bacteria Markers	-49.94	L	**0.29**	0.00	500.00
Yeast/Fungal	-48.48	L	**2.00**	0.00	132.00
Benzoate	-44.31	L	**0.29**	0.00	5.10
Glucarate	-43.29	L	**10.00**	0.00	149.00
Tartarate	-31.82	L	**2.00**	0.00	11.00
Fatty Acid Metabolism	-31.52	L	**8.50**	0.00	46.00
Phenylacetate	-28.57	L	**0.03**	0.00	0.14
a-Ketoisovalerate	-25.00	L	**0.20**	0.00	0.80
DHPP	-25.00	L	**0.20**	0.00	0.80

High Results



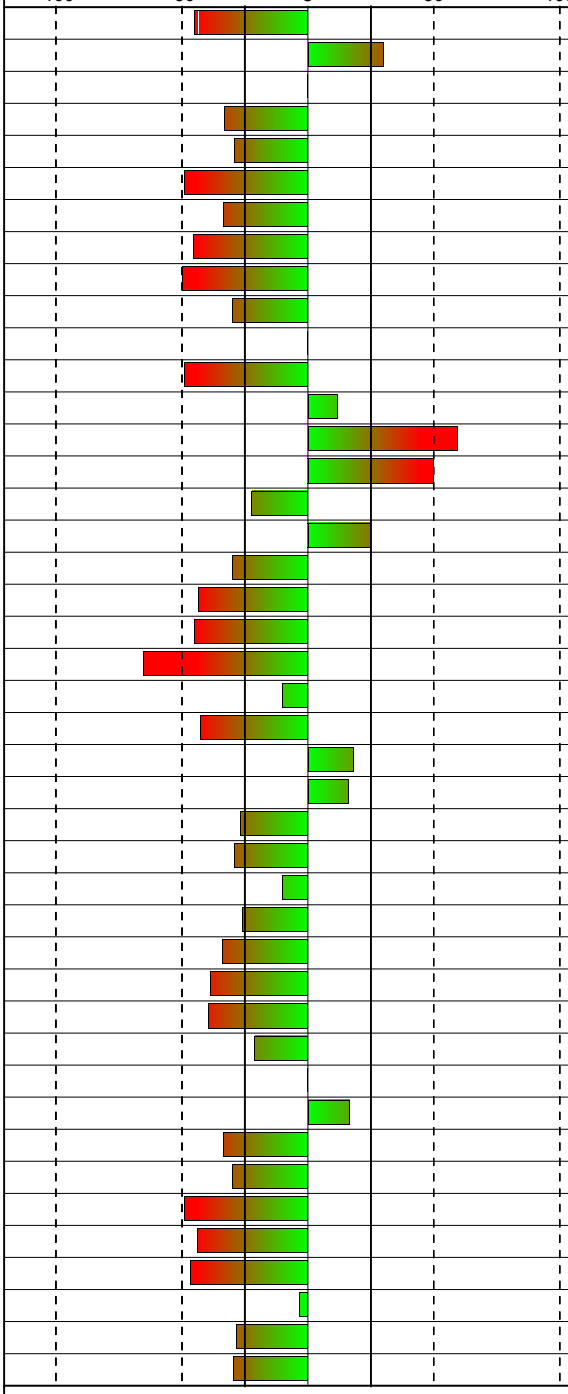
	% Status		Result	Low	High
cis-Aconitate	104.41	H	**155.00**	50.00	118.00
Phenylpropionate	78.57	H	**0.09**	0.00	0.07
8-Hydroxy-2-deoxyguan	68.18	H	**0.13**	0.00	0.11
Quinolinate	58.57	H	**3.80**	0.00	3.50
Pyroglutamate	53.13	H	**16.50**	0.00	16.00
a-Ketoglutarate	42.50	H	**27.90**	2.00	30.00
Hippurate	41.79	H	**257.00**	0.00	280.00
Homovanillate	39.09	H	**5.90**	1.00	6.50
Citrate	29.84	H	**674.00**	175.00	800.00
a-Keto-b-methylvalerate	28.57	H	**1.10**	0.00	1.40

Basic Status Report (Alphabetic)

FRANK **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

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



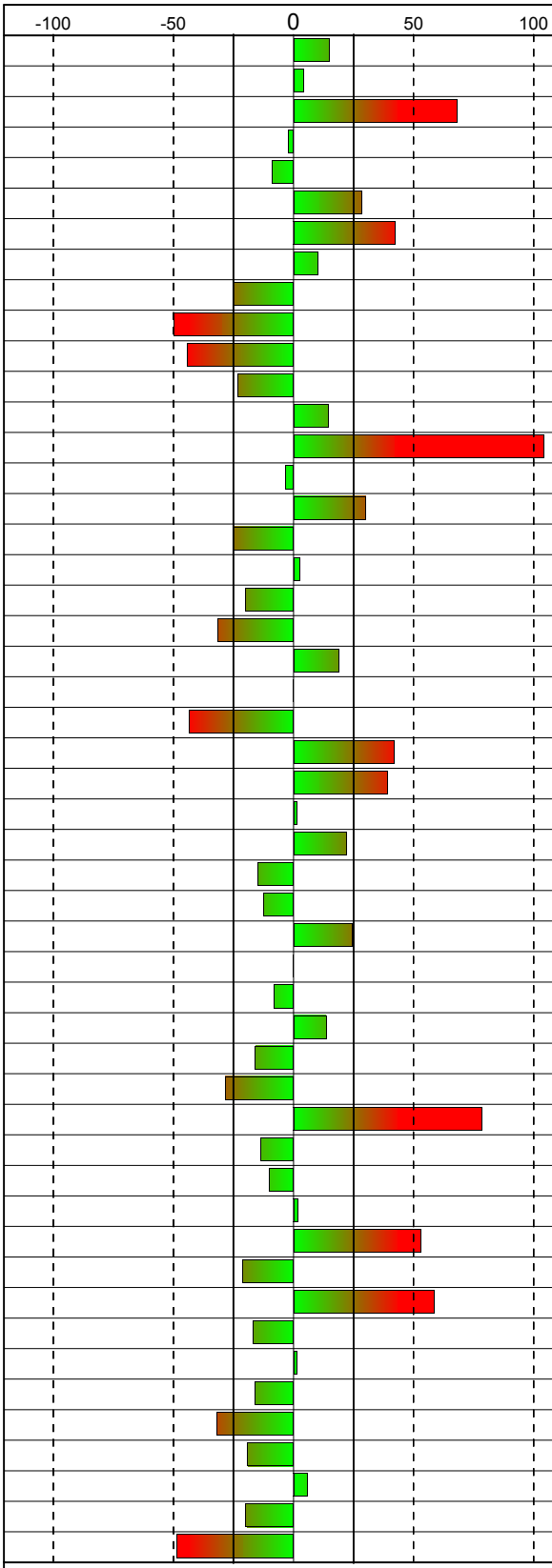
	% Status		Result	Low	High
1-Methylhistidine - P	**-45.00**	**L**	**1.00**	0.00	20.00
3-Methylhistidine - P	**30.00**	**H**	**4.00**	0.00	5.00
a-Aminoadipic Acid - P	0.00		2.00	0.00	4.00
a-Amino-N-Butyric Acid - P	**-33.33**	**L**	**15.00**	10.00	40.00
Alanine - P	**-29.14**	**L**	**323.00**	250.00	600.00
Anserine - P	**-49.00**	**L**	**0.01**	0.00	1.00
Arginine - P	**-33.64**	**L**	**68.00**	50.00	160.00
Asparagine - P	**-45.29**	**L**	**49.00**	45.00	130.00
Aspartic Acid - P	**-50.00**	**L**	**6.00**	6.00	30.00
b-Alanine - P	**-30.00**	**L**	**1.00**	0.00	5.00
b-Aminoisobutyric Acid - P	0.00		1.00	0.00	2.00
Carnosine - P	**-49.00**	**L**	**0.01**	0.00	1.00
Citrulline - P	11.82		49.00	15.00	70.00
Collagen Related AA	**59.33**	**H**	**174.00**	10.00	160.00
Cystathionine - P	**50.00**	**H**	**4.00**	0.00	4.00
Cystine - P	-22.50		32.00	10.00	90.00
Ethanolamine - P	**25.00**	**H**	**6.00**	0.00	8.00
Gamma-aminobutyric Acid-P	**-30.00**	**L**	**1.00**	0.00	5.00
Glutamic Acid - P	**-43.33**	**L**	**52.00**	45.00	150.00
Glutamine - P	**-45.11**	**L**	**622.00**	600.00	1050.00
Glycine - P	**-65.11**	**L**	**191.00**	225.00	450.00
Glycine/Serine Ratio	-10.07		2.10	1.50	3.00
Histidine - P	**-42.86**	**L**	**75.00**	70.00	140.00
Homocystine - P	18.00		0.68	0.00	1.00
Hydroxylysine - P	16.00		0.66	0.00	1.00
Hydroxyproline - P	**-26.67**	**L**	**7.00**	0.00	30.00
Isoleucine - P	**-29.09**	**L**	**73.00**	50.00	160.00
Leucine - P	-10.00		134.00	90.00	200.00
Lysine - P	**-26.00**	**L**	**186.00**	150.00	300.00
Methionine - P	**-34.00**	**L**	**29.00**	25.00	50.00
Ornithine - P	**-38.67**	**L**	**67.00**	50.00	200.00
Phenylalanine - P	**-39.47**	**L**	**55.00**	45.00	140.00
Phenylalanine/Tyrosine	-21.15		0.85	0.50	1.70
Phosphoethanolamine - P	0.00		15.00	0.00	30.00
Phosphoserine - P	16.67		8.00	0.00	12.00
Proline - P	**-33.70**	**L**	**174.00**	130.00	400.00
Sarcosine - P	**-30.00**	**L**	**1.00**	0.00	5.00
Serine - P	**-49.17**	**L**	**91.00**	90.00	210.00
Taurine - P	**-44.00**	**L**	**62.00**	50.00	250.00
Threonine - P	**-46.67**	**L**	**105.00**	100.00	250.00
Tryptophan - P	-3.33		49.00	35.00	65.00
Tyrosine - P	**-28.57**	**L**	**65.00**	50.00	120.00
Valine - P	**-29.60**	**L**	**221.00**	170.00	420.00
Total Status Deviation	**31.31**				
Total Status Skew	**-21.45**				

Basic Status Report (Alphabetic)

FRANK — **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

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



	% Status		Result	Low	High
2-Methylhippurate	14.86		0.05	0.00	0.07
5-Hydroxyindoleacetate	4.10		4.80	1.50	7.60
8-Hydroxy-2-deoxyguan	**68.18**	**H**	**0.13**	0.00	0.11
Adipate	-2.38		4.00	0.00	8.40
a-Hydroxybutyrate	-9.09		4.50	0.00	11.00
a-Keto-b-methylvalerate	**28.57**	**H**	**1.10**	0.00	1.40
a-Ketoglutarate	**42.50**	**H**	**27.90**	2.00	30.00
a-Ketoisocaproate	10.00		0.30	0.00	0.50
a-Ketoisovalerate	**-25.00**	**L**	**0.20**	0.00	0.80
Bacteria Markers	**-49.94**	**L**	**0.29**	0.00	500.00
Benzoate	**-44.31**	**L**	**0.29**	0.00	5.10
b-Hydroxybutyrate	-23.33		1.20	0.00	4.50
b-Hydroxyisovalerate	14.55		7.10	0.00	11.00
cis-Aconitate	**104.41**	**H**	**155.00**	50.00	118.00
Citramalate	-3.33		2.80	0.00	6.00
Citrate	**29.84**	**H**	**674.00**	175.00	800.00
DHPP	**-25.00**	**L**	**0.20**	0.00	0.80
D-Lactate	2.63		1.00	0.00	1.90
Ethylmalonate	-20.00		3.60	0.00	12.00
Fatty Acid Metabolism	**-31.52**	**L**	**8.50**	0.00	46.00
Formiminoglutamic Acid	18.75		0.11	0.00	0.16
Fumarate	0.00		0.50	0.00	1.00
Glucarate	**-43.29**	**L**	**10.00**	0.00	149.00
Hippurate	**41.79**	**H**	**257.00**	0.00	280.00
Homovanillate	**39.09**	**H**	**5.90**	1.00	6.50
Hydroxymethylglutarate	1.61		5.20	2.00	8.20
Indican	22.09		62.00	0.00	86.00
Isocitrate	-15.00		61.00	40.00	100.00
Kynurenate	-12.50		1.50	0.00	4.00
Lactate	24.44		8.70	2.00	11.00
Malate	0.00		0.70	0.00	1.40
Methylmalonate	-8.33		2.00	0.00	4.80
Orotate	13.64		0.70	0.00	1.10
Oxidative Damage	-16.00		0.51	0.00	1.50
Phenylacetate	**-28.57**	**L**	**0.03**	0.00	0.14
Phenylpropionate	**78.57**	**H**	**0.09**	0.00	0.07
p-Hydroxybenzoate	-13.64		0.40	0.00	1.10
P-Hydroxyphenylacetate	-10.00		18.00	0.00	45.00
p-Hydroxyphenyllactate	2.05		0.38	0.00	0.73
Pyroglutamate	**53.13**	**H**	**16.50**	0.00	16.00
Pyruvate	-21.43		0.80	0.00	2.80
Quinolinate	**58.57**	**H**	**3.80**	0.00	3.50
Suberate	-16.67		0.90	0.00	2.70
Succinate	1.58		11.80	2.00	21.00
Sulfate	-16.11		241.00	180.00	360.00
Tartarate	**-31.82**	**L**	**2.00**	0.00	11.00
Tricarballylate	-19.23		0.40	0.00	1.30
Vanillylmandelate	6.00		3.60	0.80	5.80
Xanthurenate	-20.00		0.30	0.00	1.00
Yeast/Fungal	**-48.48**	**L**	**2.00**	0.00	132.00
Total Status Deviation	**35.60**				
Total Status Skew	**8.70**				

Nutritional Support

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

- ☐ **1-CAC Entry Protocol**
  See Nutrition Detail
- ☐ **1-Pyridoxal-5-Phosphate**
  2x daily 50 mg
- ☐ **2-Betaine HCL**
  2 tablets at mealtime
- ☐ **2-Glutathione (reduced)**
  2x daily 250 mg
- ☐ **2-Magnesium Citrate or Glycinate**
  2x daily 150 mg
- ☐ **1-L-Carnitine**
  2x daily 500 mg
- ☐ **1-Vitamin E**
  2x daily 800 IU
- ☐ **2-Blood Sugar Protocol #2**
  See Nutrition-Detail
- ☐ **2-Glycine**
  2x daily 500 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
CAC Cycle Ratios	103.24%	75.35%
Neuroendocrine Met.	43.37%	-43.37%
Muscle Metabolites	43.25%	-28.25%
Immune Metabolites	41.02%	-41.02%
Gluconeogen	38.68%	-38.68%
Ammonia/Energy	37.23%	-35.55%
Hepatic Metabolism	34.68%	-15.25%
CNS Metabolism	32.91%	-25.34%
Fat Metabolism	31.63%	-31.63%
Essential Amino Acid	29.47%	-29.47%
Connective Tissue	25.31%	-13.81%
Liver Detox Indicators	25.17%	2.04%

Lab Reported out-of-range Values

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

CA Cycle Entry (652.08%)

A high result for the marker respresenting the entry into the citric acid may indicate carbohydrate metabolism impairment especially if pyruvate and/or lactate are elevated. Possibilities causing this particular blockade include mercury, arsenic or petrochemical exposure.

cis-Aconitate (104.41%)

A member of the citric acid cycle, an elevated level of this organic acid may be an indication of poor supplies or metabolism of amino acids. A clinical sign is fatigue.

Phenylpropionate (78.57%)

A high reading of this organic acid may be indicative of an overgrowth of intestinal microbiota or protozoa. The presence of this acid may be due to the action of bacteria on phenylalanine and should not appear in anything more than background amounts.

8-Hydroxy-2-deoxyguan (68.18%)

A high reading of 8-Hydroxy-2-deoxyguanosine is an indicator of oxidative DNA damage. A regime of antioxidants as well as restricting fat intake has been suggested to be a way of lowering this component of aging.

Glycine - P (-65.11%)

Glycine plays an important role in the body's ability to detoxify itself as well as in wound healing. It is also important in the creation of nucleic acids and bile acids. This amino acid is non-essential as it can be synthesized from serine and threonine. A low result may be indicative of poor nitrogen retention or a low intake of quality proteins.

Collagen Related AA (59.33%)

A high reading of this combination of Proline, Hydroxyproline and Hydroxylysine may be indicative of connective tissue breakdown. Use of vitamin C and iron may be helpful in balancing this ratio.

Quinolinate (58.57%)

A high reading of quinolinate is indicative of oxidative stress that may be favorably resolved by the use of vitamin E.

Pyroglutamate (53.13%)

A high level may be due to glutathione depletion as this organic acid is formed in the kidney from the amino acid glutathione.

Aspartic Acid - P (-50.00%)

Aspartic acid is a non-essential amino acid made from glutamate utilizing vitamin B6 in this conversion. It is involved in the urea and Krebs cycle (ammonia metabolism and carbohydrate metabolism). An excitatory amino acid, aspartic acid has been studied for the treatment of unipolar depression. This reading may be indicative of the inability to detoxify, especially ammonia. Fatigue may result from low levels.

Cystathionine - P (50.00%)
May be due to a functional B6 deficiency.

Additional Tests

The following additional lab tests may help in diagnosis.

Consider ordering prostate specific antigen (PSA)
Rationale: Sex is Male
Age is >= 40

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 a qualified health care professional.

1-CAC Entry Protocol See Nutrition Detail

CAC ENTRY PROTOCOL
When the entry point to the citric acid cycle is blocked, the ability to utilize carbohydrates to produce energy is impaired. The following protocol may be helpful in bringing down this ratio.
B-Complex - 2x daily
Amino Acid Complex - 5 grams 2x daily
CoEnzyme Q10 - 50 mg 2x daily
Alpha Lipoic Acid - 200 mg 2x daily
Vitamin C - 1000 mg 2x daily

Rationale

Decreased	Normal	Increased
		CA Cycle Entry

1-L-Carnitine 2x daily 500 mg

L-CARNITINE
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.

Decreased	Normal	Increased
Fatty Acid Metabolism		

1-Pyridoxal-5-Phosphate 2x daily 50 mg

PYRIDOXINE (B6)
B6 function involves many complex interrelated functions around amino acid metabolism. Cell processes involve PLP in immune modulation, fatty acids, steroid hormone, receptors, neurotransmitters, gluconeogenesis, and heme synthesis.

Decreased	Normal	Increased
		Cystathionine - P

1-Vitamin E 2x daily 800 IU

VITAMIN E
Vitamin E is a major antioxidant, scavenging free radicals - enhancing lymphocyte production, increasing nitrogen retention, maintaining cellular integrity, and aiding in the biosynthesis of heme proteins.
8-Hydroxy-2-deoxyguanosine elevation has been equated to excessive oxidative stress which would benefit from Vitamin E supplementation.

Decreased	Normal	Increased
		8-Hydroxy-2-deoxyguan

2-Betaine HCL 2 tablets at mealtime

BETAIN HCl
When this pattern of imbalances show up, it may be due to a BCl/betaine deficiency and suggests muscle/collagen catabolism and inadequate synthesis due to inadequate quality and/or quantity of protein.

Decreased	Normal	Increased
Hydroxyproline - P Proline - P		3-Methylhistidine - P

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 a qualified health care professional.

2-Blood Sugar Protocol #2 See Nutrition-Detail

Rationale

BLOOD SUGAR PROTOCOL #2
When certain blood sugar and lipid markers are abnormal, the following protocol is recommended: Zinc (25-30 mg 1 time daily), Magnesium (400 mg 1 time daily), Broad Spectrum Fatty Acids (1 time daily), B-Complex (1 time daily) and Trace Mineral Complex (1 time daily)
ZINC (Zn)
Active in the structure and function of biomembranes. Involved in more than 200 key enzymes including carbohydrate metabolism, connective tissue metabolism, T-cell function and prostaglandin secretion.
MAGNESIUM (Mg)
Second most abundant cation in intracellular fluid. It is involved in vasodilation, contraction, as well as cardiac and skeletal muscle cells. Required in over 300 enzymes, temperature control, neuronal homeostasis and has a profound effect on cardiac physiology.
BROAD SPECTRUM FATTY ACID
Broad spectrum fatty acids, high in Omega-3, -6 and -9 have shown a potential ability to improve immune function.
B-COMPLEX VITAMINS
B complex vitamins are involved in a broad spectrum of cell metabolic deficiencies as well as fatty acid utilization.
TRACE MINERALS
Trace minerals are critical in almost all enzymatic reactions. A proper balance is crucial in the proper utilization of vitamins, fats and carbohydrates. Important as a part of any targeted fatty acid supplementation protocol along with electrolytes and a B-vitamin complex.

Decreased	Normal	Increased
Isoleucine - P		
Threonine - P		
Alanine - P		

2-Glutathione (reduced) 2x daily 250 mg

GLUTATHIONE
Glutathione is a tripeptide made in the body from cysteine, glutamic acid and glycine. An accumulation of Pyroglutamate is indicative of glutathione depletion.

Decreased	Normal	Increased
		Pyroglutamate

2-Glycine 2x daily 500 mg

GLYCINE
Glycine is an important amino acid and it is helpful in lowering the levels of Benzoate and Hippurate.

Decreased	Normal	Increased
Benzoate		Hippurate

2-Magnesium Citrate or Glycinate 2x daily 150 mg

MAGNESIUM (Mg)
Second most abundant mineral in intracellular fluid. It helps facilitate Na - K transport and influences Ca levels. It is involved in vasodilation, contraction, as well as cardiac and skeletal muscle cells. Required in over 300 enzymes, temperature control, neuronal homeostasis and has a profound effect on cardiac physiology

Decreased	Normal	Increased
		Ethanolamine - P

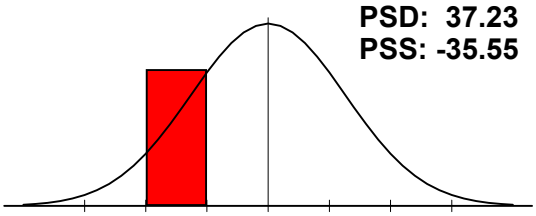
Drugs listed below tend to further aggravate elements of blood chemistry that are out of range (H or L). The (#) after each drug denotes the number of times that drug is flagged as being potentially harmful.

Aspirin(2)	Cortisol	Salicylates	Steroids

Ammonia/Energy

Arginine - P[L], Threonine - P[L], Glycine - P[L], Serine - P[L], a-Aminoadipic Acid - P, Asparagine - P[L], Aspartic Acid - P[L], Citrullin.

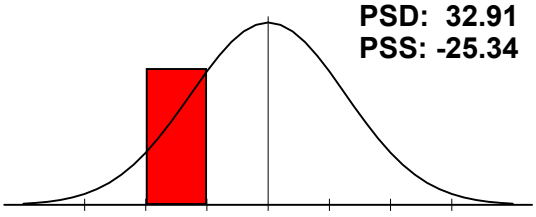
A panel profile such as this may be indicative of inadequate protein intake, poor absorption or poor quality protein intake.



CNS Metabolism

Arginine - P[L], Tryptophan - P, Gamma-aminobutyric Acid-P[L], Glycine - P[L], Serine - P[L], Taurine - P[L], Aspartic Acid - P[L], Glutamin.

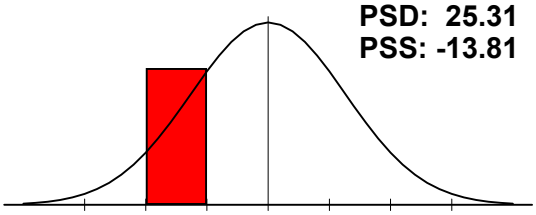
The panel profile seen here may be indicative of poor central nervous system functioning including memory loss, fatigue, poor concentration.



Connective Tissue

Leucine - P, Methionine - P[L], Valine - P[L], Cystine - P, Hydroxylysine - P, Hydroxyproline - P[L], 3-Methylhistidine - P[H], Proline - P[.

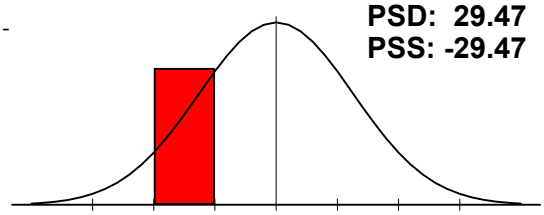
A profile such as this may be indicative of poor collagen and other tissue formation.



Essential Amino Acid

Arginine - P[L], Histidine - P[L], Isoleucine - P[L], Leucine - P, Lysine - P[L], Methionine - P[L], Phenylalanine - P[L], Threonine - P[L],.

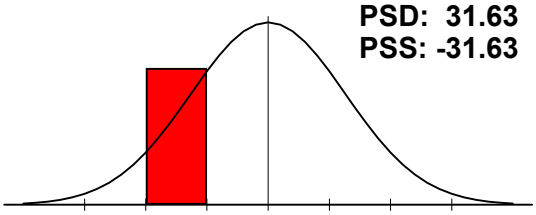
The panel profile seen here indicates a low density of essential amino acids. Since they cannot be synthesized in the human body, these building blocks must be taken in via diet or supplements.



Fat Metabolism

Arginine - P[L], Isoleucine - P[L], Leucine - P, Valine - P[L], Taurine - P[L], Glutamine - P[L], Sarcosine - P[L].

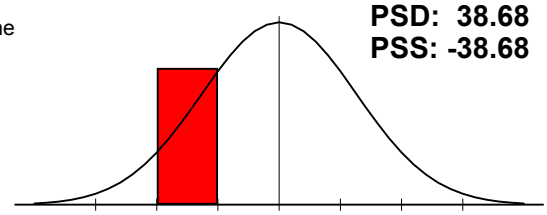
A panel profile such as this may indicate an inability of the body to properly metabolize dietary fats. Check for dysbiosis, or try supplementation with lipase digestive enzymes as well as broad spectrum amino acids.



Gluconeogen

Threonine - P[L], Tryptophan - P, Glycine - P[L], Serine - P[L], Alanine - P[L].

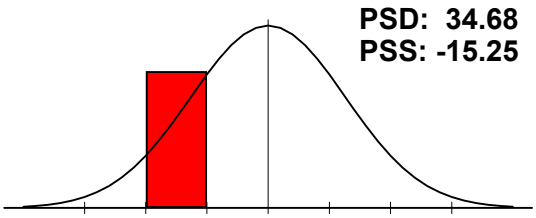
This panel profile may be indicative of hypoglycemia or poor dietary protein intake.



Hepatic Metabolism

Methionine - P[L], Taurine - P[L], Glutamine - P[L], Cystine - P, Cystathionine - P[H], Homocystine - P, Alanine - P[L].

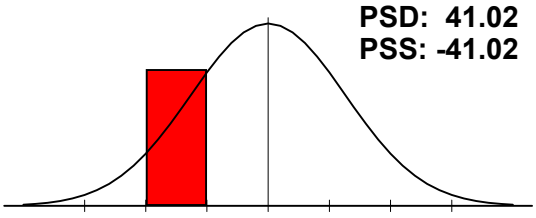
A panel profile such as this may be indicative of an underfunctioning liver or poor dietary protein intake.



Immune Metabolites

Arginine - P[L], Threonine - P[L], Glutamine - P[L], Ornithine - P[L].

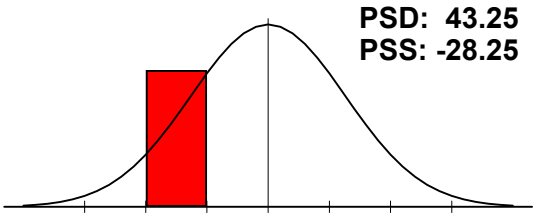
A panel profile such as this may be indicative of a poor functioning immune system or low dietary intake of protein.



Muscle Metabolites

Anserine - P[L], Carnosine - P[L], 1-Methylhistidine - P[L], 3-Methylhistidine - P[H].

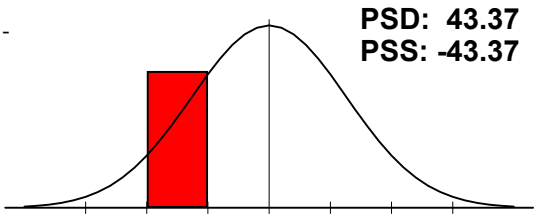
This panel profile may be indicative of the lack of ability in building muscle or a poor dietary intake of protein.



Neuroendocrine Met.

Gamma-aminobutyric Acid-P[L], Glycine - P[L], Serine - P[L], Taurine - P[L], Tyrosine - P[L].

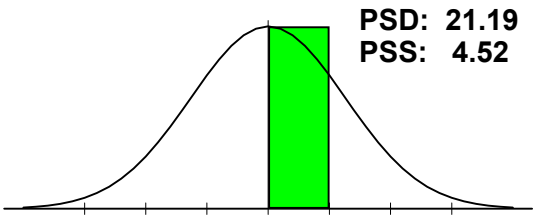
This panel profile may be indicative of an underfunctioning endocrine system or poor dietary intake of protein.



Amino Acid Catabolism

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

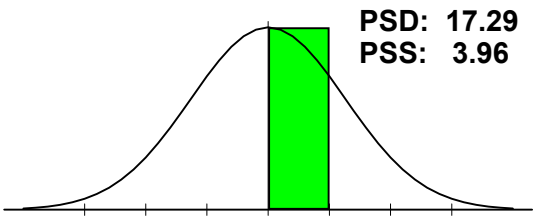
A normal reading in this panel suggest proper amino acid stores.



B-Complex Markers

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

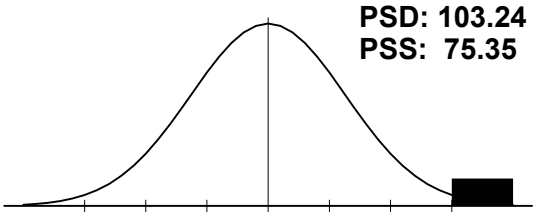
A normal panel profile such as this is an indicator of adequate intake of B-complex vitamins.



CAC Cycle Ratios

CA Cycle Entry[H], CA Cycle Phase 1, CA Cycle Phase 2[L], CA Cycle Phase 3, CA Cycle Phase 4[L], CA Cycle Phase 5, CA Cycle Phase 6[H], CA C.

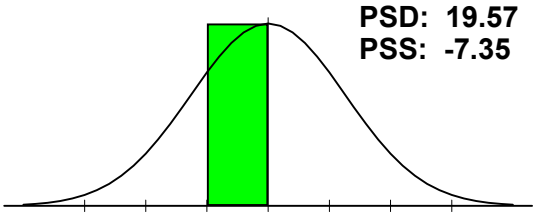
This panel reflects steps of the citric acid cycle. A low reading may be indicative of poor energy production and/or vitamin, mineral and amino acid deficiencies.



Carbohydrate Metabolism

Lactate, Pyruvate, a-Hydroxybutyrate, b-Hydroxybutyrate.

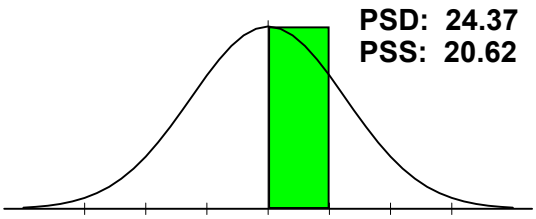
A normal reading is consistant with the proper metabolism of dietary carbohydrates.



Citric Acid Cycle

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

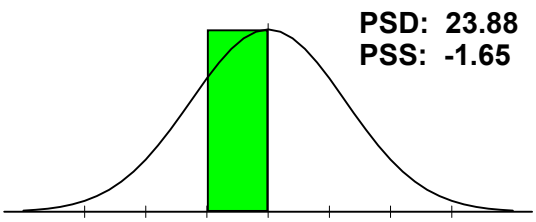
A normal reading such as this is consistant with a properly functioning citric acid cycle.



Intestinal Dysbiosis

Hippurate[H], Benzoate[L], p-Hydroxybenzoate, p-Hydroxyphenyllactate, Phenylacetate[L], Phenylpropionate[H], Tricarballylate, DHPP[L], Citra.

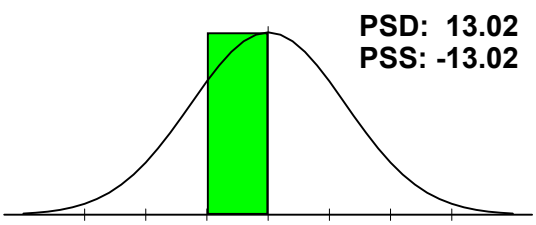
A normal panel profile such as this is consistant with good intestinal health but may suggest a need for probiotic supplementation.



Lipid Metabolism

Adipate, Suberate, Ethylmalonate.

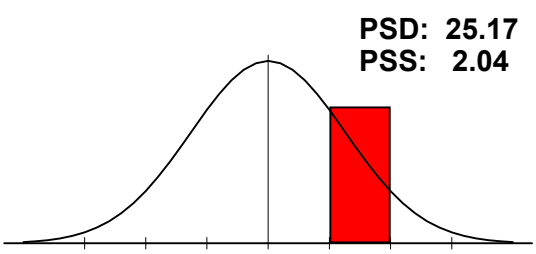
This panel profile is indicative of proper lipid metabolism.



Liver Detox Indicators

2-Methylhippurate, Glucarate[L], P-Hydroxyphenylacetate, Orotate, Pyroglutamate[H], Sulfate.

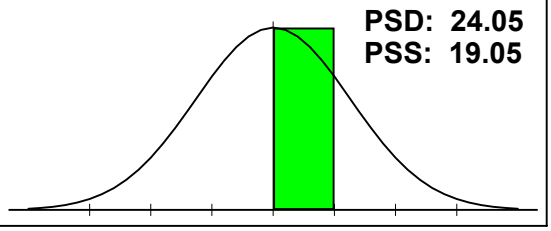
This panel profile may be due in part to environmental toxins, improper regulation of cell growth, hereditary deficiencies, and a depressed ability of the liver to detoxify itself. A program of detoxification may be helpful in this case. Review Nutritional Status for additional recommendations.



Neurotransmitters

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

A normal panel profile indicated good neurotransmitter production.



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.

Cystathioninuria (270.4) 100.00% (1 of 1)

Decreased	Normal	Increased
		50.00 Cystathionine - P

Fatigue/Low Cellular Energy Production () 100.00% (1 of 1)

Decreased	Normal	Increased
-50.00 Aspartic Acid - P		

Impaired Ca+ and Zn Transport () 100.00% (2 of 2)

Decreased	Normal	Increased
-49.00 Anserine - P		
-49.00 Carnosine - P		

Mild Hyperammonemia () 100.00% (1 of 1)

Decreased	Normal	Increased
-43.33 Glutamic Acid - P		

Potential Excessive Oxidative Damage () 100.00% (1 of 1)

Decreased	Normal	Increased
-44.00 Taurine - P		

Potential Rheumatoid Arthritis () 100.00% (1 of 1)

Decreased	Normal	Increased
-42.86 Histidine - P		

Ammonia Toxicity/Buildup () 75.00% (3 of 4)

Decreased	Normal	Increased
-29.09 Isoleucine - P		-45.11 Glutamine - P
-50.00 Aspartic Acid - P		
-43.33 Glutamic Acid - P		

Depression () 75.00% (3 of 4)

Decreased	Normal	Increased
-34.00 Methionine - P		
-39.47 Phenylalanine - P		
-3.33 Tryptophan - P		
-28.57 Tyrosine - P		

Comparison Progress Report

FRANK **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

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

Status % on:	11/18/2002		3/11/2003		+/- change
Collagen Related AA	22.00		**59.33**	**H**	**- 37.33**
Valine - P	-0.80		**-29.60**	**L**	**- 28.80**
Tryptophan - P	**-53.33**	**L**	-3.33		+ 50.00
Lysine - P	**-56.00**	**L**	**-26.00**	**L**	**+ 30.00**

Comparison Report

FRANK — **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

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:	11/18/2002		3/11/2003	
-45.00 ← **30.00**	-	1-Methylhistidine - P	**30.00**	H	**-45.00**	L
10.00 → **30.00**	-	3-Methylhistidine - P	10.00		**30.00**	H
		AA Competency	**-40.73**	L	**-43.91**	L
-48.15 → **-31.48**	+	AA Competency-1	**-48.15**	L	**-31.48**	L
-24.62 ← -10.96	-	AA Competency-2	-10.96		-24.62	
		a-Aminoadipic Acid - P	0.00		0.00	
-33.33 ← -20.00	-	a-Amino-N-Butyric Acid - P	-20.00		**-33.33**	L
		Alanine - P	-24.29		**-29.14**	L
		Anserine - P	**-49.00**	L	**-49.00**	L
-51.82 → **-33.64**	+	Arginine - P	**-51.82**	L	**-33.64**	L
-45.29 ← **-27.65**	-	Asparagine - P	**-27.65**	L	**-45.29**	L
-50.00 ← **-33.33**	-	Aspartic Acid - P	**-33.33**	L	**-50.00**	L
		b-Alanine - P	**-30.00**	L	**-30.00**	L
		b-Aminoisobutyric Acid - P	0.00		0.00	
		Carnosine - P	**-49.00**	L	**-49.00**	L
		Citrulline - P	10.00		11.82	
22.00 → **59.33**	-	Collagen Related AA	22.00		**59.33**	H
		Cystathionine - P	**50.00**	H	**50.00**	H
-40.00 → -22.50	+	Cystine - P	**-40.00**	L	-22.50	
25.00 ← **37.50**	+	Ethanolamine - P	**37.50**	H	**25.00**	H
		Gamma-aminobutyric Acid-P	**-30.00**	L	**-30.00**	L
		Glutamic Acid - P	**-48.10**	L	**-43.33**	L
		Glutamine - P	**-51.33**	L	**-45.11**	L
-65.11 ← **-55.78**	-	Glycine - P	**-55.78**	L	**-65.11**	L
		Glycine/Serine Ratio	-7.24		-10.07	
		Histidine - P	**-42.86**	L	**-42.86**	L
		Homocystine - P	18.00		18.00	
		Hydroxylysine - P	23.00		16.00	
-26.67 ← 16.67	-	Hydroxyproline - P	16.67		**-26.67**	L
-29.09 ← -12.73	-	Isoleucine - P	-12.73		**-29.09**	L
		Leucine - P	-13.64		-10.00	
-56.00 → **-26.00**	+	Lysine - P	**-56.00**	L	**-26.00**	L
		Methionine - P	**-38.00**	L	**-34.00**	L
-38.67 ← **-30.00**	-	Ornithine - P	**-30.00**	L	**-38.67**	L
		Phenylalanine - P	**-38.42**	L	**-39.47**	L
		Phenylalanine/Tyrosine	-16.40		-21.15	
-13.33 → 0.00	+	Phosphoethanolamine - P	-13.33		0.00	
0.00 → 16.67	-	Phosphoserine - P	0.00		16.67	
-54.44 → **-33.70**	+	Proline - P	**-54.44**	L	**-33.70**	L
		Sarcosine - P	**-30.00**	L	**-30.00**	L
		Serine - P	**-42.50**	L	**-49.17**	L
		Taurine - P	**-50.50**	L	**-44.00**	L
		Threonine - P	**-40.67**	L	**-46.67**	L
-53.33 → -3.33	+	Tryptophan - P	**-53.33**	L	-3.33	
		Tyrosine - P	**-32.86**	L	**-28.57**	L
-29.60 ← -0.80	-	Valine - P	-0.80		**-29.60**	L
		Total Status Deviation	**30.46**		**31.31**	
		Total Status Skew	**-21.01**		**-21.45**	

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

Status % on:	11/18/2002		3/11/2003		+/- change
cis-Aconitate	-1.84		**104.41**	**H**	**- 102.58**
Phenylpropionate	-16.67		**78.57**	**H**	**- 61.90**
Pyroglutamate	15.00		**53.13**	**H**	**- 38.13**
Fumarate	**110.00**	**H**	0.00		+ 110.00
Tartarate	**110.00**	**H**	**-31.82**	**L**	**+ 78.18**
Vanillylmandelate	**83.33**	**H**	6.00		+ 77.33
p-Hydroxybenzoate	**84.00**	**H**	-13.64		+ 70.36
2-Methylhippurate	**83.00**	**H**	14.86		+ 68.14
Succinate	**-52.00**	**L**	1.58		+ 50.42
5-Hydroxyindoleacetate	**-40.48**	**L**	4.10		+ 36.38
Adipate	**-36.67**	**L**	-2.38		+ 34.29
a-Ketoisocaproate	**-40.00**	**L**	10.00		+ 30.00
Pyruvate	**50.00**	**H**	-21.43		+ 28.57
Methylmalonate	**-36.67**	**L**	-8.33		+ 28.33
p-Hydroxyphenyllactate	**30.00**	**H**	2.05		+ 27.95
Sulfate	**-42.78**	**L**	-16.11		+ 26.67
Citrate	**56.17**	**H**	**29.84**	**H**	**+ 26.33**
Tricarballylate	**-44.44**	**L**	-19.23		+ 25.21

Comparison Report

FRANK — **Amino Acid & Organic Acid Date: 3/11/2003**

Male / Age: 59

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

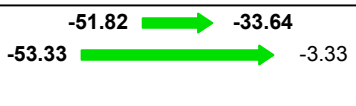
	+/-	Status % on:	11/18/2002		3/11/2003	
14.86 → **83.00**	+	2-Methylhippurate	**83.00**	H	14.86	
-40.48 → 4.10	+	5-Hydroxyindoleacetate	**-40.48**	L	4.10	
-36.67 → -2.38	+	Adipate	**-36.67**	L	-2.38	
-21.20 → -9.09	+	a-Hydroxybutyrate	-21.20		-9.09	
		a-Keto-b-methylvalerate	**34.17**	H	**28.57**	H
-25.91 → **42.50**	-	a-Ketoglutarate	**-25.91**	L	**42.50**	H
-40.00 → 10.00	+	a-Ketoisocaproate	**-40.00**	L	10.00	
-25.00 → -10.00	-	a-Ketoisovalerate	-10.00		**-25.00**	L
-44.31 → **-34.00**	-	Benzoate	**-34.00**	L	**-44.31**	L
		b-Hydroxybutyrate	-17.50		-23.33	
		b-Hydroxyisovalerate	-19.00		14.55	
-1.84 → **104.41**	-	cis-Aconitate	-1.84		**104.41**	H
		Citramalate	5.00		-3.33	
29.84 → **56.17**	+	Citrate	**56.17**	H	**29.84**	H
-25.00 → -5.56	-	DHPP	-5.56		**-25.00**	L
-40.00 → -20.00	+	Ethylmalonate	**-40.00**	L	-20.00	
0.00 → **110.00**	+	Fumarate	**110.00**	H	0.00	
24.63 → **41.79**	-	Hippurate	24.63		**41.79**	H
-50.00 → **39.09**	+	Homovanillate	**-50.00**	L	**39.09**	H
1.61 → 15.00	+	Hydroxymethylglutarate	15.00		1.61	
		Isocitrate	21.33		-15.00	
-38.08 → 24.44	+	Lactate	**-38.08**	L	24.44	
		Malate	-5.00		0.00	
-36.67 → -8.33	+	Methylmalonate	**-36.67**	L	-8.33	
		Orotate	17.78		13.64	
		Phenylacetate	**-33.33**	L	**-28.57**	L
-16.67 → **78.57**	-	Phenylpropionate	-16.67		**78.57**	H
-13.64 → **84.00**	+	p-Hydroxybenzoate	**84.00**	H	-13.64	
-22.00 → -10.00	+	P-Hydroxyphenylacetate	-22.00		-10.00	
2.05 → **30.00**	+	p-Hydroxyphenyllactate	**30.00**	H	2.05	
15.00 → **53.13**	-	Pyroglutamate	15.00		**53.13**	H
-21.43 → **50.00**	+	Pyruvate	**50.00**	H	-21.43	
		Suberate	15.00		-16.67	
-52.00 → 1.58	+	Succinate	**-52.00**	L	1.58	
-42.78 → -16.11	+	Sulfate	**-42.78**	L	-16.11	
-31.82 → **110.00**	+	Tartarate	**110.00**	H	**-31.82**	L
-44.44 → -19.23	+	Tricarballylate	**-44.44**	L	-19.23	
6.00 → **83.33**	+	Vanillylmandelate	**83.33**	H	6.00	
		Total Status Deviation	**86.31**		**35.60**	
		Total Status Skew	**50.82**		**8.70**	

FRANK
Male / Age: 59

Amino Acid & Organic Acid Date: 3/11/2003

Ammonia/Energy	11/18/2002		3/11/2003		+/-
Arginine - P	**-51.82**	**L**	**-33.64**	**L**	**+**
Threonine - P	**-40.67**	**L**	**-46.67**	**L**	
Glycine - P	**-55.78**	**L**	**-65.11**	**L**	**-**
Serine - P	**-42.50**	**L**	**-49.17**	**L**	
a-Aminoadipic Acid - P	0.00		0.00		
Asparagine - P	**-27.65**	**L**	**-45.29**	**L**	**-**
Aspartic Acid - P	**-33.33**	**L**	**-50.00**	**L**	**-**
Citrulline - P	10.00		11.82		
Glutamic Acid - P	**-48.10**	**L**	**-43.33**	**L**	
Glutamine - P	**-51.33**	**L**	**-45.11**	**L**	
Ornithine - P	**-30.00**	**L**	**-38.67**	**L**	**-**
a-Amino-N-Butyric Acid - P	-20.00		**-33.33**	**L**	**-**
Alanine - P	-24.29		**-29.14**	**L**	
b-Alanine - P	**-30.00**	**L**	**-30.00**	**L**	
PSS / PSD	-31.82 / 33.25		-35.55 / 37.23		

CNS Metabolism	11/18/2002		3/11/2003		+/-
Arginine - P	**-51.82**	**L**	**-33.64**	**L**	**+**
Tryptophan - P	**-53.33**	**L**	-3.33		**+**
Gamma-aminobutyric Acid-P	**-30.00**	**L**	**-30.00**	**L**	
Glycine - P	**-55.78**	**L**	**-65.11**	**L**	**-**
Serine - P	**-42.50**	**L**	**-49.17**	**L**	
Taurine - P	**-50.50**	**L**	**-44.00**	**L**	
Aspartic Acid - P	**-33.33**	**L**	**-50.00**	**L**	**-**
Glutamine - P	**-51.33**	**L**	**-45.11**	**L**	
Ethanolamine - P	**37.50**	**H**	**25.00**	**H**	**+**
Phosphoethanolamine - P	-13.33		0.00		**+**
Phosphoserine - P	0.00		16.67		**-**
PSS / PSD	-31.31 / 38.13		-25.34 / 32.91		



Connective Tissue	11/18/2002		3/11/2003		+/-
Leucine - P	-13.64		-10.00		
Methionine - P	**-38.00**	**L**	**-34.00**	**L**	
Valine - P	-0.80		**-29.60**	**L**	**-**
Cystine - P	**-40.00**	**L**	-22.50		**+**
Hydroxylysine - P	23.00		16.00		
Hydroxyproline - P	16.67		**-26.67**	**L**	**-**
3-Methylhistidine - P	10.00		**30.00**	**H**	**-**
Proline - P	**-54.44**	**L**	**-33.70**	**L**	**+**
PSS / PSD	-12.15 / 24.57		-13.81 / 25.31		

Panel/Subset Comparison Report

FRANK
Male / Age: 59

Amino Acid & Organic Acid Date: 3/11/2003

Essential Amino Acid	11/18/2002		3/11/2003		+/-
Arginine - P	**-51.82**	**L**	**-33.64**	**L**	+
Histidine - P	**-42.86**	**L**	**-42.86**	**L**	
Isoleucine - P	-12.73		**-29.09**	**L**	-
Leucine - P	-13.64		-10.00		
Lysine - P	**-56.00**	**L**	**-26.00**	**L**	+
Methionine - P	**-38.00**	**L**	**-34.00**	**L**	
Phenylalanine - P	**-38.42**	**L**	**-39.47**	**L**	
Threonine - P	**-40.67**	**L**	**-46.67**	**L**	
Tryptophan - P	**-53.33**	**L**	-3.33		+
Valine - P	-0.80		**-29.60**	**L**	-
PSS / PSD	-34.83 / 34.83		-29.47 / 29.47		

Fat Metabolism	11/18/2002		3/11/2003		+/-
Arginine - P	**-51.82**	**L**	**-33.64**	**L**	+
Isoleucine - P	-12.73		**-29.09**	**L**	-
Leucine - P	-13.64		-10.00		
Valine - P	-0.80		**-29.60**	**L**	-
Taurine - P	**-50.50**	**L**	**-44.00**	**L**	
Glutamine - P	**-51.33**	**L**	**-45.11**	**L**	
Sarcosine - P	**-30.00**	**L**	**-30.00**	**L**	
PSS / PSD	-30.12 / 30.12		-31.63 / 31.63		

Gluconeogen	11/18/2002		3/11/2003		+/-
Threonine - P	**-40.67**	**L**	**-46.67**	**L**	
Tryptophan - P	**-53.33**	**L**	-3.33		+
Glycine - P	**-55.78**	**L**	**-65.11**	**L**	-
Serine - P	**-42.50**	**L**	**-49.17**	**L**	
Alanine - P	-24.29		**-29.14**	**L**	
PSS / PSD	-43.31 / 43.31		-38.68 / 38.68		

Hepatic Metabolism	11/18/2002		3/11/2003		+/-
Methionine - P	**-38.00**	**L**	**-34.00**	**L**	
Taurine - P	**-50.50**	**L**	**-44.00**	**L**	
Glutamine - P	**-51.33**	**L**	**-45.11**	**L**	
Cystine - P	**-40.00**	**L**	-22.50		+
Cystathionine - P	**50.00**	**H**	**50.00**	**H**	
Homocystine - P	18.00		18.00		
Alanine - P	-24.29		**-29.14**	**L**	
PSS / PSD	-19.45 / 38.87		-15.25 / 34.68		

Immune Metabolites	11/18/2002		3/11/2003		+/-
Arginine - P	**-51.82**	**L**	**-33.64**	**L**	+
Threonine - P	**-40.67**	**L**	**-46.67**	**L**	
Glutamine - P	**-51.33**	**L**	**-45.11**	**L**	
Ornithine - P	**-30.00**	**L**	**-38.67**	**L**	-
PSS / PSD	-43.45 / 43.45		-41.02 / 41.02		

FRANK
Male / Age: 59

Amino Acid & Organic Acid Date: 3/11/2003

Muscle Metabolites	11/18/2002		3/11/2003		+/-
Anserine - P	**-49.00**	**L**	**-49.00**	**L**	
Carnosine - P	**-49.00**	**L**	**-49.00**	**L**	
1-Methylhistidine - P	**30.00**	**H**	**-45.00**	**L**	-
3-Methylhistidine - P	10.00		**30.00**	**H**	-
PSS / PSD	-14.50 / 34.50		-28.25 / 43.25		

Neuroendocrine Met.	11/18/2002		3/11/2003		+/-
Gamma-aminobutyric Acid-P	**-30.00**	**L**	**-30.00**	**L**	
Glycine - P	**-55.78**	**L**	**-65.11**	**L**	-
Serine - P	**-42.50**	**L**	**-49.17**	**L**	
Taurine - P	**-50.50**	**L**	**-44.00**	**L**	
Tyrosine - P	**-32.86**	**L**	**-28.57**	**L**	
PSS / PSD	-42.33 / 42.33		-43.37 / 43.37		

Amino Acid Catabolism	11/18/2002		3/11/2003		+/-
a-Ketoisovalerate	-10.00		**-25.00**	**L**	-
a-Ketoisocaproate	**-40.00**	**L**	10.00		+
a-Keto-b-methylvalerate	**34.17**	**H**	**28.57**	**H**	
PSS / PSD	-5.28 / 28.06		4.52 / 21.19		

B-Complex Markers	11/18/2002		3/11/2003		+/-
b-Hydroxyisovalerate	-19.00		14.55		
a-Ketoisovalerate	-10.00		**-25.00**	**L**	-
a-Ketoisocaproate	**-40.00**	**L**	10.00		+
a-Keto-b-methylvalerate	**34.17**	**H**	**28.57**	**H**	
Methylmalonate	**-36.67**	**L**	-8.33		+
PSS / PSD	-14.30 / 27.97		3.96 / 17.29		

CAC Cycle Ratios	11/18/2002	3/11/2003	+/-
PSS / PSD	0.00 / 0.00	75.35 / 103.24	

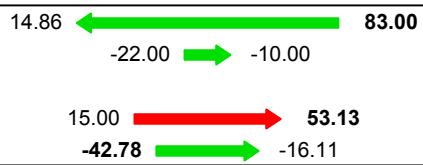
Carbohydrate Metabolism	11/18/2002		3/11/2003		+/-
Lactate	**-38.08**	**L**	24.44		+
Pyruvate	**50.00**	**H**	-21.43		+
a-Hydroxybutyrate	-21.20		-9.09		+
b-Hydroxybutyrate	-17.50		-23.33		
PSS / PSD	-6.69 / 31.69		-7.35 / 19.57		

Citric Acid Cycle	11/18/2002		3/11/2003		+/-
Citrate	**56.17**	**H**	**29.84**	**H**	+
cis-Aconitate	-1.84		**104.41**	**H**	-
Isocitrate	21.33		-15.00		
a-Ketoglutarate	**-25.91**	**L**	**42.50**	**H**	-
Succinate	**-52.00**	**L**	1.58		+
Fumarate	**110.00**	**H**	0.00		+
Malate	-5.00		0.00		
Hydroxymethylglutarate	15.00		1.61		+
PSS / PSD	14.72 / 35.91		20.62 / 24.37		

Intestinal Dysbiosis	11/18/2002		3/11/2003		+/-
Hippurate	24.63		**41.79**	H	-
Benzoate	**-34.00**	L	**-44.31**	L	-
p-Hydroxybenzoate	**84.00**	H	-13.64		+
p-Hydroxyphenyllactate	**30.00**	H	2.05		+
Phenylacetate	**-33.33**	L	**-28.57**	L	
Phenylpropionate	-16.67		**78.57**	H	-
Tricarballylate	**-44.44**	L	-19.23		+
DHPP	-5.56		**-25.00**	L	-
Citramalate	5.00		-3.33		
Tartarate	**110.00**	H	**-31.82**	L	+
PSS / PSD	6.23 / 33.71		-1.65 / 23.88		

Lipid Metabolism	11/18/2002		3/11/2003		+/-
Adipate	**-36.67**	L	-2.38		+
Suberate	15.00		-16.67		
Ethylmalonate	**-40.00**	L	-20.00		+
PSS / PSD	-20.56 / 30.56		-13.02 / 13.02		

Liver Detox Indicators	11/18/2002		3/11/2003		+/-
2-Methylhippurate	**83.00**	H	14.86		+
P-Hydroxyphenylacetate	-22.00		-10.00		+
Orotate	17.78		13.64		
Pyroglutamate	15.00		**53.13**	H	-
Sulfate	**-42.78**	L	-16.11		+
PSS / PSD	8.50 / 30.09		2.04 / 25.17		



Neurotransmitters	11/18/2002		3/11/2003		+/-
Vanillylmandelate	**83.33**	H	6.00		+
Homovanillate	**-50.00**	L	**39.09**	H	+
5-Hydroxyindoleacetate	**-40.48**	L	4.10		+
PSS / PSD	-1.43 / 34.76		19.05 / 24.05