Hair Tissue Analysis Report

Lab ID:	HT11		
Client:	Client	Date of Birth:	15-Sep-64
Sampling Date:	3-Dec-15	Date Received:	4-Dec-15
Date Received:	4-Dec-15	Report Date:	10-Dec-15
Practitioner:			

labwest
hair tissue analysis

28 Boulder Rd
Malaga WA 6090
ph: +61 (0)8 9248 9321
fax: +61 (0)8 9248 7801
www.labwest.com.au

	Element	Result (µg/g)	Reference Range*	Reference Range*
Toxic Elements	Aluminium (Al)	14.2	0-40	
	Antimony (Sb)	0.180	0-0.1	
	Arsenic (As)	0.020	0-0.2	
	Beryllium (Be)	0.001	0-0.02	
	Cadmium (Cd)	0.210	0-0.15	
	Mercury (Hg)	0.831	0-1	
	Lead (Pb)	4.570	0-3	
	Uranium (U)	0.003	0-0.1	
Other Trace Elements	Barium (Ba)	2.80	0-3	
	Bismuth (Bi)	0.709	0-0.5	
	Germanium (Ge)	0.012	0-0.1	
	Lithium (Li)	0.039	0-0.1	
	Nickel (Ni)	0.767	0-0.6	
	Platinum (Pt)	0.002	0-0.005	
	Rubidium (Rb)	0.137	0-0.15	
	Silver (Ag)	0.146	0-0.2	
	Thallium (Tl)	0.000	0-0.02	
	Thorium (Th)	0.001	0-0.006	
	Tin (Sn)	1.134	0-1.2	
	Titanium (Ti)	3.43	0-2	
	Vanadium (V)	0.014	0-0.2	
	Zirconium (Zr)	0.036	0-0.5	
	Total Rare-Earths	0.029	0-0.15	
Nutrient Elements	Boron (B)	1.5	0.2-4	
	Calcium (Ca)	1802	200-1500	
	Chromium (Cr)	0.11	0.05-0.8	
	Cobalt (Co)	0.19	0.002-0.2	
	Copper (Cu)	33	10-34	
	Iron (Fe)	24	5-18	
	Magnesium (Mg)	289	20-120	
	Manganese (Mn)	0.616	0.08-0.7	
	Molybdenum (Mo)	0.040	0.02-0.1	
	Phosphorus (P)	105	100-200	
	Potassium (K)	74	10-200	
	Selenium (Se)	0.15	0.3-1.5	
	Sodium (Na)	484	20-500	
	Strontium (Sr)	21.83	0-8	
	Sulphur (S)	47386	40-50000	
	Zinc (Zn)	285	110-240	
Key Ratios	Sodium:Potassium (Na/K)	6.6	1.4-3.4	
	Calcium:Potassium (Ca/K)	24.5	2.2-6.2	
	Calcium:Phosphorus (Ca/P)	17.1	1-9	
	Calcium:Magnesium (Ca/Mg)	6.2	3-11	
	Zinc:Copper (Zn/Cu)	9	4-12	
	Zinc:Cadmium (Zn/Cd)	1357	>500	
	Copper:Molybdenum (Cu/Mo)	829	<625	

*Note: This report is for guidance only, and should not be solely relied upon when assessing nutritional requirements. Chart scales have been normalised to facilitate comparison.

Hair Tissue Analysis Report

Lab ID:	HT11		
Client:	Client	Date of Birth:	15-Sep-64
Sampling Date:	3-Dec-15	Date Received:	4-Dec-15
Date Received:	4-Dec-15	Report Date:	10-Dec-15
Practitioner:			

labwest
hair tissue analysis
28 Boulder Rd
Malaga WA 6090
ph: +61 (0)8 9248 9321
fax: +61 (0)8 9248 7801
www.labwest.com.au

Other Ratios:	Result	Other Ratios:	Result
Selenium:Mercury (Se/Hg)	0.18	Zinc:Iron (Zn/Fe)	11.98
Calcium:Sodium (Ca/Na)	3.73	Zinc:Magnesium (Zn/Mg)	0.99
Calcium:Lead (Ca/Pb)	394	Zinc:Manganese (Zn/Mn)	463
Calcium:Iron (Ca/Fe)	75.71	Iron:Copper (Fe/Cu)	0.72
Calcium:Copper (Ca/Cu)	54.3	Iron:Mercury (Fe/Hg)	28.65
Calcium:Strontium (Ca/Sr)	83	Iron:Manganese (Fe/Mn)	39
Calcium:Zinc (Ca/Zn)	6.32	Sodium:Magnesium (Na/Mg)	1.67
Zinc:Mercury (Zn/Hg)	343	Iron:Lead (Fe/Pb)	5.21
Zinc:Chromium (Zn/Cr)	2683		

DISCLAIMER:
LabWest Hair Tissue Analysis (LabWest) provides accurate analysis of hair mineral content; the report is provided on an "information only" basis, and does not contain clinical advice. LabWest encourages users of this information to seek advice from an appropriate health practitioner before making decisions based on any aspect of this report. Never disregard, delay seeking or discontinue medical advice based on information contained in this report.

REFERENCE RANGES:
The reference ranges shown in this report have been established from multiple sources, and result from a combination of information in the public domain, published research papers and LabWest's analysis results. They are provided as an indication only, and diagnosing health practitioners should satisfy themselves independently as to the significance and suitability of applicable reference levels.

Toxic Elements: These elements are referred to as “toxic” due to their potential to interfere with the body’s normal biological functions. Although present in trace amounts in our environment, accumulation of high levels of these elements is undesirable as it may lead to adverse health effects.
Other Trace Elements: These elements are potentially of interest in assessing biological systems, and may offer supporting evidence in diagnoses. Total Rare Earth Metals Load includes the Lanthanides (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu) plus Yttrium (Y) and Scandium (Sc).
Nutrient Elements: The major nutrient elements are considered essential to the proper functioning of biological systems and consequently human health. Metabolism is dependent on appropriate supply and balance of these elements.
Key Ratios: With the major nutrient elements, relative concentration ratios may be as important as absolute levels as factors affecting efficient function of biological systems. This is due to the synergistic effect of these elements, for example sodium and potassium.

RETESTING:
Labwest urges users of this data to express caution when determining courses of action based on single data points. A trend in a particular value can be of significantly greater importance than a result from a single point in time, which may be influenced by other factors (e.g. contamination). Therefore Labwest recommends that, in addition to professional healthcare advice, a follow-up test be conducted after six-to-eight-weeks to assess trends in the metal concentrations.

Hair Tissue Analysis Comments

A. Toxic Elements

* Aluminium content is within reference range
* Antimony content is above reference range.

High antimony levels in hair air can result from chronic exposure, inhalation or ingestion of this element. Antimony can affect liver functions and impair enzymes and metabolism resulting in elevated blood and/or urine levels of hypoxanthine, uric acid and possibly ammonia. Antimony can deposit in bone, kidney, and the organs of the endocrine system. The USEPA notes primary effects from chronic exposure to antimony in humans to be: respiratory effects that include antimony pneumoconiosis (inflammation of the lungs due to irritation caused by the inhalation of dust), alterations in pulmonary function, chronic bronchitis, chronic emphysema, inactive tuberculosis, pleural adhesions, and irritation. Other effects noted in humans chronically exposed to antimony by inhalation are cardiovascular effects (increased blood pressure, altered EKG readings and heart muscle damage) and gastrointestinal disorders. Symptoms of antimony toxicity may include fatigue, myopathy, hypotension, angina and immune dysregulation. Environmental contamination is possible, so a followup test is recommended to confirm high antimony levels.

* Arsenic content is within reference range
* Beryllium content is within reference range
* Cadmium content is above reference range.

High hair cadmium levels generally correlate well with levels in the body, resulting from chronic ingestion of this element. Cadmium accumulates in the body like other heavy metals, and can inhibit enzymes, displacing zinc or copper. It also impairs cellular functions. Symptoms of cadmium toxicity include hypertension and impaired renal function due to accumulation of the metal in the kidneys. Cadmium can have negative effects on heart, lung, bone and testes. The USEPA has classified cadmium as a probable human carcinogen.

* Mercury content is within reference range
* Lead content is above reference range.

High lead levels may result from chronic exposure. Symptoms of lead toxicity may include: impaired heme synthesis, impaired synthesis of RNA, DNA and protein and impaired metabolism of vitamin D. Lead may also be nephrotoxic, resulting in disordered renal transport (and possibly gout), elevated amino acids, glucose and phosphates in urine. Further symptoms may include fatigue, headaches, loss of appetite, insomnia, nervousness, anemia, weight loss, decreased nerve conduction and possibly motor neuron disorders. According to the USEPA, lead in the blood of children can result in: behavior and learning problems, lower IQ and hyperactivity, slowed growth, hearing problems, anaemia. In pregnant women, lead can cross the placental barrier exposing the fetus the lead. This can result in serious effects to the mother and her developing fetus, including: reduced growth of the fetus, premature birth.

* Uranium content is within reference range

B. Other Trace Elements

* Barium content is within reference range
* Bismuth content is above reference range.

Bismuth levels in hair may reflect past or chronic ingestion. Potential exists for mild toxicity, though therapeutic bismuth compounds are not toxic when used appropriately. High bismuth levels can have negative effects on the liver, kidney, stomach and skin. Bismuth poisoning may result in mental confusion.

* Germanium content is within reference range
* Lithium content is within reference range
* Nickel content is above reference range.

Hair nickel level reflects exposure and ingestion. Nickel can displace zinc and copper in cells, thereby affecting enzyme activity. High nickel levels may result in hypersensitivity of the immune system. Symptoms of high nickel levels include rhinitis, sinusitis, conjunctivitis and asthma, resulting from heightened allergic functions. Other symptoms may include vertigo, weakness and fatigue, nausea and headache.

Hair Tissue Analysis Comments

* Platinum content is within reference range
* Rubidium content is within reference range
* Silver content is within reference range
* Thallium content is within reference range
* Thorium content is within reference range
* Tin content is within reference range
* Titanium content is above reference range.

High titanium levels are often associated with elevated tin, antimony, aluminium and nickel. Although considered non-toxic, elevated titanium levels may be an indicator that other mineral imbalances are present. High titanium levels may be due to external contamination sources such as cosmetics and sun-blocks, which contain titanium dioxide.

* Vanadium content is within reference range
* Zirconium content is within reference range
* Total rare earth element content is within reference range

C. Nutrient Elements

* Boron content is within reference range
* Calcium content is above reference range.

High hair calcium may result from high detary intake, or mobilisation of the element in the body. Other nutrient minerals (magnesium, phosphorus) can affect bioavailability of calcium, the lack of which can cause depositions of calcium outside of preferred sites, in tissues such as hair, joints, blood vessels, gall bladder, lymph nodes, etc. Associated conditions may include: osteoporosis, hypoglycaemia, hormonal and metabolic imbalances. Note: Hair calcium levels may be altered by perming solutions, dyes or bleaches. Reported Ca levels in treated hair may therefore be higher than actually reflected in metabolism.

* Chromium content is within reference range
* Cobalt content is within reference range
* Copper content is within reference range
* Iron content is above reference range.

The relationship between iron levels in hair and body tissue concentrations is uncertain. Hair levels outside of reference ranges may indicate certain clinical conditions or use of medication.

* Magnesium content is above reference range.

High levels of magnesium in hair may not be correlated with blood levels, and may be due to imbalances with calcium or phosphorus. Renal failure, hypoglycemia, and chronic physical or emotional stress may lead to elevated hair magnesium. Elevated hair magnesium nearly always means magnesium depletion in the body, possibly because of increased magnesium excretion. The same is true of hair calcium and hair zinc.

* Manganese content is within reference range
* Molybdenum content is within reference range
* Phosphorus content is within reference range
* Potassium content is within reference range
* Selenium content is below reference range.

Selenium plays a fundamental role in neutralization of free radicals and protection against viral infections. Hair treatments (such as bleaches) can leach selenium from the hair, leading to low results. Food sources of selenium : whole grains , asparagus , garlic , eggs , mushrooms , fish , lean meat. Symptoms of Se deficiency are similar to that of vitamin E deficiency and include muscle aches, increased inflammatory response, loss of body weight, alopecia, listlessness, skeletal and muscular degeneration, growth stunting, and depressed immune function.

* Sodium content is within reference range

Hair Tissue Analysis Comments

* Strontium content is above reference range.
Hair strontium levels generally correlate with body levels, and also calcium levels. Excess strontium is not generally of concern.
* Sulphur content is within reference range
* Zinc content is above reference range.
High hair zinc is commonly indicative of low zinc in plasma and cells, or excessive zinc supplementation (and uncommonly zinc overload). Zinc can be displaced from the body (proteins) by other metals, particularly cadmium, lead, copper, and mercury, resulting in elevated hair zinc. High hair zinc may also be due to the use of zinc-containing anti-dandruff shampoo. Zinc is an essential element in many important biological processes, though can be toxic if exposure is excessive. Symptoms of excessively high zinc include: gastrointestinal disorders, decreased heme synthesis (copper deficiency), tachycardia, blurred vision, and hypothermia.

D. Key Ratios

* Sodium:potassium ratio is above reference range.
"Stress Ratio". Hair Na/K may reflect cellular imbalance of these minerals. Symptoms associated with high ratios include acute stress, inflammation, and possibly zinc and/or magnesium deficiency or the presence of toxic metals. Ratios above 2.5 may be seen in situations of anxiety.
* Calcium:potassium ratio is above reference range.
"Thyroid Ratio". High ratio indicates fatigue.
* Calcium:phosphorus ratio is above reference range.
Indicative of slow metabolism and predisposition to deposit calcium in joints and arteries.
* Calcium:magnesium ratio is within reference range.
* Zinc:copper ratio is within reference range.
* Zinc:cadmium ratio is within reference range.
* Copper:molybdenum ratio is above reference range.
Potential copper overload is indicated.