Micro Trace Minerals Laboratory
40+ years of clinical & environmental laboratory diagnostics

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MTM Newsletter **N° 36 - September 2024**

Laboratory News

What you should know about hair analysis

Sodium (Na) and Potassium (K) in Hair Tissue
Back in the 1980s, we were investigating potassium and sodium measurements in hair. The aim was to find out how valuable hair sodium and potassium concentrations are for therapeutic use. The reason: some laboratories claim that K and Na measurements (from unwashed hair samples) provide information about adrenal gland functions.

In 2005, the Human Biomonitoring Commission of the German Federal Environment Agency stated that due to its easy availability, human hair is a useful diagnostic test. Hair reflects the average exposure over a long period of time.

The Federal Environmental Agency also points out that exogenous substances that have been deposited on the hair shaft by dust, hair care products or sweat must be removed during sample preparation, or else results are unreliable. Micro Trace Minerals Laboratory has always washed hair samples prior to testing.

To prove the point, we carried out another test before and after the washing process. Hair samples from two adults and one child were tested.

Table 1: Sodium- and Potassium-Test values before and after washing

		Adult	Adult	Child
	Element	2H283320	2H283372	1KH283284
Before washing	**Sodium**	**303.7**	**146.4**	**651.3**
After washing	**Sodium**	**5.5**	**6.1**	**3.6**
Before washing	**Potassium**	**123.4**	**73.9**	**654.0**
After washing	**Potassium**	**7.8**	**8.2**	**5.9**

Values in mg/kg / Detection limit: Na: 10mg/kg; K: 10 mg/kg

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Conclusion:
Table 1 shows that the washing process effectively reduced potassium and sodium values. Measurement fell below the limit of detection, i.e. neither potassium nor sodium could be detected. This confirms our earlier studies and indicates that the washing process is essential when analysing hair. To test for adrenal function, blood tests are required.

Our laboratory will NOT measure potassium or sodium in hair. MTM provides diagnostically and therapeutically relevant measurements. This is what we stand for.

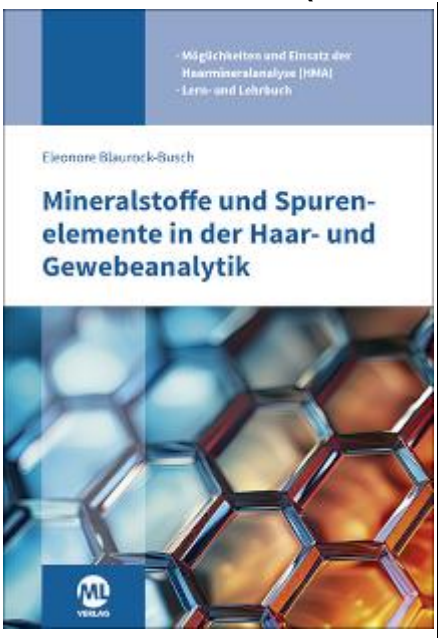
- **DMSA capsules are now available in France and Switzerland**

DMSA capsules are now available in France and Switzerland as prescription items.

More information:
SUCCICAPTAL 200 mg capsule - VIDAL

Succimer: active substance with therapeutic effect - VIDAL

- **New Book Publication (German only)**



Minerals and trace elements in hair and tissue analysis

Language	German
Softcover	224 pages
Publisher	mgo fachverlage
ISBN Print	978-3-96474-702-0
Print book price	€ 49.95 (about US$ 55.00, depending on exchange rate)
ISBN eBook	978-3-96474-703-7
eBook price:	€ 44.95 (about US$ 50.00, depending on exchange rate)

https://shop.mgo-fachverlage.de/mineralstoffe-und-spurenelemente-in-der-haar-und-gewebeanalytik.html

Reading sample, can be downloaded on our website (German only):
https://microtraceminerals.com/books-by-eblaurock-busch/hair-analysis

We will be happy to accept your order. Or contact the bookstore of your choice.

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Research into Bone Metabolism

Calcium (Ca) in Hair Analysis
Miekeley N et al. Department of Chemistry, Pontifical Catholic University, Rio de Janeiro, Brazil. **Elemental anomalies in hair as indicators of endocrinologic pathologies and deficiencies in calcium and bone metabolism.** J Trace Elem Med Biol. 2001;15(1):46-55.

Abstract:
In Rio de Janeiro, hair tests were carried out on 900 women over 40 years of age. Results showed that abnormal hair calcium concentrations indicated metabolic pathologies. Very low readings were found in 72 women over 60 years of age and could be associated with osteoporosis. The statistics confirmed the hypothesis that calcium, in conjunction with abnormal readings of other elements such as Mn, Mg, Sr, Ba or Cd, influences endocrinological pathologies.

Patients with hypoparathyroidism showed significantly reduced hair calcium concentrations. The statistical evaluation indicated that abnormal element concentrations in hair can be used for the diagnosis of the above-mentioned pathologies. This demonstrates that hair analysis is useful as a complementary test for the detection of calcium/bone metabolism problems.

Strontium (Sr) and Osteoporosis
In contrast to calcium, strontium occurs only in small amounts in the human body. Sr has no known biological significance and is not essential.

Calcium and strontium behave similarly, both chemically and physiologically. Strontium is not unknown in medicine: the element was already used in the 1950s in osteoporosis therapy. According to researchers at the Mayo Clinic, Sr can improve bone density. The drug strontium Ranelate was used alongside bisphosphonates to treat osteoporosis after menopause. Due to the drug's serious side effects, its use was severely restricted by the European Medicines Agency in 2013. In 2017, the drug was taken off the market in Germany.

The human body barely distinguishes between calcium and strontium. It incorporates strontium into bones like calcium. Small amounts of naturally occurring strontium do not harm the organism; however, the radioactive isotope strontium-90 is classified as dangerous due to its accumulation in bones and its long biological half-life. Radioactive Sr-90 is spread in the biosphere through nuclear weapons tests and can be detected due to its half-life of 28.8 years. In medicine, Sr-90 is used in radiotherapy for some types of cancer.

Because of its similarity to calcium, strontium accumulates to a high degree in bone, and may seriously interfere with the normal process of bone development. The young are particularly vulnerable because a lack of discrimination between calcium and strontium occurs during a dynamic period of bone formation and growth. For this reason, body burdens of strontium will be higher in children than in adults, and the health effects associated with high Sr-exposure levels would be more severe. As suggested in one human study and demonstrated in several animal studies, strontium 'rickets' is one potential consequence of childhood exposure to excess stable strontium. (1)

Since strontium can take over the role and function of calcium, and it is assumed that calcium deficiency enhances strontium absorption. The author attempted to prove this hypothesis statistically:

For this purpose, almost 25,000 hair samples were statistically evaluated. Of these, 2,050 measurements (less than 10%) showed a hair calcium concentration below the low reference range, which indicates insufficient intake or a faulty calcium metabolism. Of the 2,050 measurements, 283 or well over 10% showed a high strontium concentration. This seems to indicate that calcium deficiency promotes strontium absorption.

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Note: It is advisable to pay attention to calcium levels when using Sr-containing medications or when Sr-exposure is suspected. In some region, water contains high amounts of strontium. Testing serum calcium, hair calcium and water levels is recommended.

(1) Toxicological Profile for Strontium. Atlanta (GA): Agency for Toxic Substances and Disease Registry (US); 2004 Apr. 3, HEALTH EFFECTS.

- **Hair Mineral Analysis: When to retest?**

A repeat test to prove the effect of a nutritional or detoxification therapy should not be carried out before 6 months. Hair growth corresponds to approximately 1 to 1.5 cm per month. The sample should be taken close to the scalp.

- **Topic of our next Newsletter**

Our next newsletter will deal with the detection of metals in saliva, before and after the chew test, as well as relevant metal-specific diseases.

This and previous newsletters can be found under:
https://microtraceminerals.com/en/news

If you need information, please contact us at **service@microtraceminerals.com**.

Medical Workshops and Conferences

- **International Conferences & Workshops 2024**

At the moment we do not have any workshops planned or scheduled.

If you are interested in workshops on environmental issues, chelation, laboratory testing or metal toxicology, check our website:
https://microtraceminerals.com/en/workshops-and-seminars

- **Webinars**

At the moment we do not have any webinars planned or scheduled.

For registration and further information, please visit:
https://www.edudip.com/academy/e.blaurock-busch

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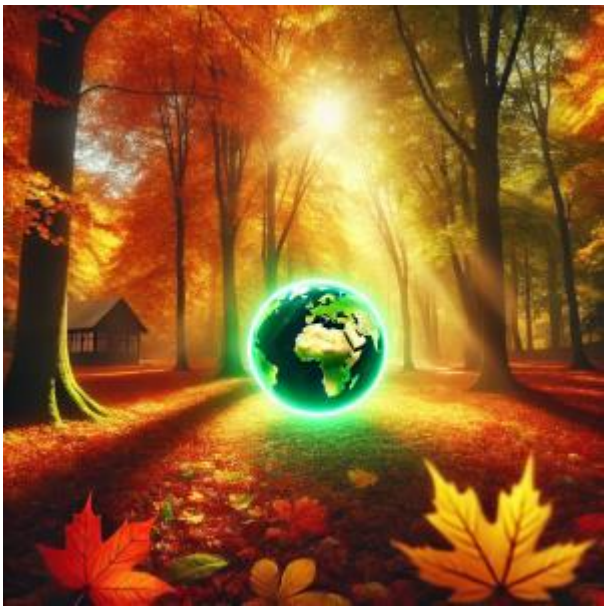

We wish you a wonderful fall season.

And all the best

E. Blaurock-Busch, Yvette Busch and Team