

Haar Mineral Analyse

Internationale wissenschaftliche Studien

KUPFER:



1: [Can Vet J.](#) 2006 Sep; 47(9):902-6. [Links](#)

Copper deficiency in yaks on pasture in western China.

- [Shen XY.](#)
- [Du GZ.](#)
- [Chen YM.](#)
- [Fan BL.](#)

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The clinical signs of a disorder in yaks (*Bos grunniens*), known locally as "swayback ailment," in the Qing Hai-Tibetan Plateau are described. The purpose of this study is to investigate the possibility that swayback ailment is iron (Fe)-induced copper (Cu) deficiency. The mean concentrations of Cu in soil and forage from affected areas and unaffected areas are similar and within the normal ranges. The mean concentrations of Cu in blood and hair from the affected yaks was significantly lower ($P < 0.01$) than that in unaffected yaks. The mean concentrations of Fe in soil and forage were significantly higher ($P < 0.01$) in affected than in unaffected areas. Affected yaks showed a hypochromic microcytic anemia and a low level of ceruloplasmin. Oral administration of copper sulphate prevented and cured the disease. We conclude that "swayback disorder" of yaks is caused by secondary Cu deficiency, mainly due to the high Fe content in forage.
PMID: 17017658 [PubMed - indexed for MEDLINE]

EISEN ZINK SELEN

HUMANA PRESS

1: [Biol Trace Elem Res.](#) 2006 Summer; 111(1-3):23-9. [Links](#)

Serum and hair levels of zinc, selenium, iron, and copper in children with iron-deficiency anemia.

- [Gurgoze MK.](#)
- [Olcucu A.](#)
- [Aygun AD.](#)
- [Taskin E.](#)
- [Kilic M.](#)

Department of Pediatrics, Faculty of Medicine, Firat University, Elazig, Turkey.
In the present study, the serum and hair levels of zinc, selenium, and copper were determined in children with iron-deficiency anemia (IDA). A total of 52 anemic children aged 1-4 yr constituted the study group. Forty-six healthy children acted as controls. The copper and zinc levels were measured with an atomic absorption spectrophotometer. Serum and hair selenium was determined by a spectrofluorometric method. The serum zinc and selenium concentrations in the IDA group were found to be significantly lower and serum copper significantly higher than those in the controls ($p < 0.05$). Lower iron, zinc, and selenium concentrations ($p < 0.001$) but not copper were found in hair ($p > 0.05$).
PMID: 16943594 [PubMed - indexed for MEDLINE]

17 Elemente wurden gemessen bei Schlaganfall Patienten

HUMANA PRESS

1: [Biol Trace Elem Res.](#) 2006 Summer; 111(1-3):11-22. [Links](#)

Multivariate analysis of the selected metals in the hair of cerebral palsy patients versus controls.

- [Khalique A.](#)
- [Shah MH.](#)
- [Jaffar M.](#)
- [Shaheen N.](#)
- [Tariq SR.](#)
- [Manzoor S.](#)

Department of Chemistry, Quaid-i-Azam University, Islamabad 45320, Pakistan.
Seventeen metals were measured in scalp hair samples from cerebral palsy patients (CPPs) and controls. Samples were collected from 95 CPPs and 93 controls. The nitric acid-perchloric acid wet digestion procedure was used for quantification of the selected metals by flame atomic absorption spectrophotometry. The concentrations of Ag, Ca, Cd, Co, Cr, Li, and Mg were significantly higher and those of Cu, Fe, K, Mn, Na, Ni, Pb, and Sb were lower in the hair of CPPs compared with controls. A strong positive correlation was found between Ca and Mg in the hair of controls but not in that of CPPs. Antimony was found significantly negative in terms of its correlation with Co and Cu in CPPs group but not in the controls. Principal component analysis (PCA) of the data extracted seven

Kupfer Zink

1: [Environ Sci Technol](#). 2006 May 15; 40(10):3423-8. [Links](#)

Advanced analysis of metal distributions in human hair.

- [Kempson IM](#).
- [Skinner WM](#).
- [Kirkbride KP](#).

Ian Wark Research Institute, University of South Australia, Mawson Lakes, S.A., 5095, Australia. Ivan.Kempson@unisa.edu.au
A variety of techniques (secondary electron microscopy with energy dispersive X-ray analysis, time-of-flight--secondary ion mass spectrometry, and synchrotron X-ray fluorescence) were utilized to distinguish metal contamination occurring in hair arising from endogenous uptake from an individual exposed to a polluted environment, in this case a lead smelter. Evidence was sought for elements less affected by contamination and potentially indicative of biogenic activity. The unique combination of surface sensitivity, spatial resolution, and detection limits used here has provided new insight regarding hair analysis. Metals such as Ca, Fe, and Pb appeared to have little representative value of endogenous uptake and were mainly due to contamination. **Cu and Zn**, however, demonstrate behaviors worthy of further investigation into relating hair concentrations to endogenous function.
PMID: 16749716 [PubMed - indexed for MEDLINE]

- Kupfer (copper)
- Zink (zinc)
- Senen (selenium)
- Mangan (manganese)
- Chrom (chromium)
- Molybdän (molybdenum)
- Kobalt (cobalt)
- Jod (iodine)

1: [Brain Dev](#). 2006 Sep; 28(8):521-5. Epub 2006 Apr 17.  [Links](#)

A preliminary analysis of trace elements in the scalp hair of patients with severe motor disabilities receiving enteral nutrition.

- [Munakata M](#).
- [Onuma A](#).
- [Kobayashi Y](#).
- [Haginoya K](#).
- [Yokoyama H](#).
- [Fujiwara I](#).
- [Yasuda H](#).
- [Tsutsui T](#).
- [Iinuma K](#).

Department of Pediatrics, Tohoku University School of Medicine, Sendai, Japan. muna@ped.med.tohoku.ac.jp
The concentrations of essential trace elements (**copper, zinc, selenium, manganese, chromium, molybdenum, cobalt, and iodine**) in the scalp hair of 21 patients with severe motor disabilities receiving enteral nutrition were measured using inductively coupled plasma-mass spectrometry. Preliminary results show that copper, selenium, and molybdenum concentrations in the patients' hair were significantly lower than those in an age-matched control group ($p < 0.01$). This suggests that intake of these elements may be reduced in patients receiving restricted enteral nutrition, although the clinical significance of these results should be discussed.
PMID: 16616446 [PubMed - indexed for MEDLINE]

- Kupfer bei Rheuma

1: [Ann Acad Med Stetin](#). 2005; 51 Suppl 1:129-33. [Links](#)

[Copper content in rheumatoid arthritis patients]

[Article in Polish]

- [Strecker D.](#)

Zakład Pielęgniarstwa Klinicznego i Rehabilitacyjnego Pomorskiej Akademii Medycznej ul. Powstanców Wlkp. 72, 70-110 Szczecin. The aim of the study was to test the content serum, erythrocytes and hair copper and the relation between the level of copper and the activity disease in the rheumatoid arthritis (RA) patients. The subjects of this research were 58 persons with RA. In the control group there were 27 healthy subjects. The concentration of copper were determined by atomic absorption spectroscopy. The obtained results showed significant increase of the mean concentration of serum copper in RA patients (19.1 +/- 4.5 micromol/L) in comparison with control group (14.2 +/- 2.7 micromol/L, $p < 0.001$). The mean level of hair copper was also significantly increased in the examined group (14.3 +/- 4.2 microg/g dry mass) in comparison with healthy subjects (10.4 +/- 3.7 microg/g dry mass, $p < 0.01$) and considerably lower in erythrocytes (RA patients - 67.6 +/- 13.4 microg/dL, control group - 84.2 +/- 8.2 microg/dL, $p < 0.001$). Moreover, it was established that mean serum copper concentration in the examined group was significantly correlated with erythrocyte sedimentation rate ($r = 0.48$, $p < 0.001$) and Ritchie articular index ($r = 0.36$, $p < 0.01$) and negatively with hemoglobin ($r = -0.41$, $p < 0.01$). Copper content is not dependent on sex, age and disease duration. PMID: 16602440 [PubMed - indexed for MEDLINE]

Nickel und orthopädische Prothesen

1: [Minerva Stomatol.](#) 2006 Mar;55(3):115-21. [Links](#)

Nickel ions release in patients with fixed orthodontic appliances.

[Article in English, Italian]

- [Levrini L.](#)
- [Lusvardi G.](#)
- [Gentile D.](#)

Dental School, Faculty of Medicine and Surgery University of Insubria, Varese, Italy. luca.levrini@uninsubria.it
 AIM: The extent to which orthodontic appliances can cause contact allergies due to nickel release is a controversial matter. Since the data provided by literature are contrasting, the Authors think that it is important to analyse nickel ions released in organic tissues by means of a plasma spectrometer. METHODS: About 100 intact hairs were taken from 15 patients wearing fixed orthodontic appliances. The hairs had been washed 12 to 24 h before, in order to limit environmental contamination. The same procedure was carried out on a control group corresponding in sex, age and abode. The samples of hair were taken from at least 3 different scalp sites: frontal, vertex and occipital areas. RESULTS: According to the spectrophotometric analysis of the hair, there were no differences in nickel concentrations between the test group (0.50 mg/g on average) and control group (0.64 mg/g) (* $P < 0.005$). The mean value was reduced even further if minimum and maximum values were excluded (test group 0.46 mg/g, control group 0.52 mg/g). Even though there was a slight difference (0.14 mg/g), it showed that more nickel concentration was found in the control sample (without orthodontic appliances) to a maximum of 2.20 mg/g. This suggests that environmental contamination, in particular diet, has an influence on ion concentration. Other studies also confirm that gut absorption of nickel released in the mouth by orthodontic appliances is much lower than the absorption of nickel release through diet. CONCLUSIONS: It can be assumed that orthodontic appliances do not release significant values of nickel to be a risk factor to the patient's health. PMID: 16575383 [PubMed - indexed for MEDLINE]

- Eisen und Parkinson
- Calcium
- Magnesium
- Zink



1: [J Trace Elem Med Biol.](#) 2005;19(2-3):195-201. Epub 2005 Oct 24.  [FULL-TEXT ARTICLE](#) [Links](#)

Calcium, copper, iron, magnesium, silicon and zinc content of hair in Parkinson's disease.

- [Forte G.](#)
- [Alimonti A.](#)
- [Violante N.](#)
- [Di Gregorio M.](#)
- [Senofonte O.](#)
- [Petrucci F.](#)
- [Sancesario G.](#)
- [Bocca B.](#)

Dipartimento Ambiente e Connessa Prevenzione Primaria, Istituto Superiore di Sanita, Viale Regina Elena 299, 00161 Rome, Italy. The aetiology of Parkinson's disease (PD) is still unknown, but some hypotheses have focused on the imbalances in body levels of metals as co-factors of risk. To assess whether hair could be a reliable marker of possible changes, calcium (Ca), copper (Cu), iron (Fe), magnesium (Mg), silicon (Si) and zinc (Zn) were determined in hair from 81 patients affected by PD and 17 age-matched controls. **Care was taken to eliminate external contamination of the hair by thorough washing.** Digestion of the matrix was achieved by an acid-assisted microwave procedure. Quantification of the elements was performed by inductively coupled plasma atomic emission spectrometry. Results indicated significantly lower levels of Fe in the hair of patients ($p = 0.018$) compared with controls. Ca and Mg levels were slightly lower while Zn levels were higher in patients, although these differences were not significant; neither were variations in Cu and Si. Ca and Mg were at least 1.5 times higher in females than in males in both controls and patients. In addition, Ca correlated positively with Mg in both groups and in both sexes (p -value always less than 0.03), and negatively with age in patients ($p < 0.01$). Finally, element levels did not correlate with either the duration or the severity of the disease or with anti-Parkinson treatment. PMID: 16325536 [PubMed - indexed for MEDLINE]

- Mangan
- Arsen
- Cadmium

1: [Neurotoxicology](#). 2006 Mar;27(2):210-6. Epub 2005 Nov 28.  [Links](#)

Neuropsychological correlates of hair arsenic, manganese, and cadmium levels in school-age children residing near a hazardous waste site.


- [Wright RO](#),
- [Amarasiriwardena C](#),
- [Woolf AD](#),
- [Jim R](#),
- [Bellinger DC](#).

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A pilot study was conducted to explore the potential associations between hair metal levels and the neuropsychological function and behavior of school-aged children. Thirty-two children, 11-13 years old, were administered a battery of tests that assessed general intelligence, visual-motor skills, receptive language, verbal memory, nonverbal problem-solving, and behavior problems. Parents and teachers rated the children's attention, executive functions, and behavior problems. **The concentrations of manganese (Mn), arsenic (As), and cadmium (Cd) were measured in hair samples provided by 31 of the children.** The mean hair metal levels were: Mn, 471.5 parts per billion (ppb); As, 17.8 ppb; Cd, 57.7 ppb. Children's general intelligence scores, particularly verbal IQ scores, were significantly related, inversely, to hair Mn and As levels, as were scores on tests of memory for stories and a word list. In some cases, a significant Mn-by-As interaction was found. It appeared that it was the low scores of children for whom both Mn and As levels were above the median values in the sample that were responsible for the main effects observed for each metal. No other significant relationships were found. These results suggest the need to study further the neuropsychological correlates of developmental exposure to Mn and As, particularly as a mixture.

PMID: 16310252 [PubMed - indexed for MEDLINE]

- Kalzium (Ca)
- Kupfer (Cu)
- Eisen (Fe)
- Magnesium (Mg)
- Kalium (K)
- Natrium (Na)
- Zink (Zn) und Body Mass Index

1: [Clin Chem Lab Med](#). 2005; 43(4):389-93.  [Links](#)

Concentrations of calcium, copper, iron, magnesium, potassium, sodium and zinc in adult female hair with different body mass indexes in Taiwan.

- [Wang CT](#),
- [Chang WT](#),
- [Zeng WF](#),
- [Lin CH](#).

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We investigated concentrations of calcium, copper, iron, magnesium, potassium, sodium and zinc using atomic absorption spectroscopy in the hair of four groups of adult females (n = 392), ranging in age from 20 to 50 years, with different body mass index (BMI): BMI < 18, slim group; BMI 18-25, normal group; BMI 26-35, overweight or obese group; and BMI >35, morbidly obese group. We found that the group with BMI < 18 had the highest ratios for [Ca]/[Mg], [Fe]/[Cu] and [Zn]/[Cu], but the lowest ratio for [K]/[Na] in hair. On the contrary, the group with BMI > 35 had the highest ratio for [K]/[Na], but the lowest for [Fe]/[Cu] and [Zn]/[Cu] in hair. Furthermore, when we compared concentrations of Ca, Cu, Fe, Mg, K, Na and Zn between the groups with BMI < 18 and BMI > 35, we found that there were significant differences (p < 0.05) in zinc concentrations between these two groups. In addition, there were significant differences in Ca, Cu, Mg, K and Na concentrations, with p < 0.01 at least. From this point of view, we suggest that hair concentrations of **Ca, Cu, Fe, Mg, K, Na and Zn may be correlated with adult female BMI**, but further studies are needed.

PMID: 15899654 [PubMed - indexed for MEDLINE]

- Zink

 1: [Wei Sheng Yan Jiu](#). 2004 Nov; 33(6):727-31. [Links](#)

[Effects of high level Zn intake on metabolism in man]

[Article in Chinese]

- [Xiang Y.](#)
- [Yang X.](#)
- [Bian J.](#)
- [Wang L.](#)

Shandong Institute for Prevention & Treatment of Endemic Disease, Jinan 250014, China.

OBJECTIVE: To observe the effects of high level Zn intake on zinc (Zn) copper (Cu), lipids metabolism and antioxidation function in man so as to provide scientific basis for Zn supplementation. METHODS: 40 rural healthy men were chosen and tablets of 50 mg Zn (as 0.2 g of zinc gluconate) per day was taken by them for eight weeks. All subjects were checked up for five times: at week 0, 2, 4, 8 during the period of Zn supplementation and at week 12 and their serum, RBC, hair, and 24h-urine were collected for assays at the same time. RESULTS: (1) Zn contents in serum, RBC and hair increased significantly after 2 to 4 weeks supplementation and decreased at 4 weeks after stopping supplementation, but they were still higher than those before supplementation. Zn contents in 24h-urine increased significantly after supplementation and decreased at 4 weeks after stopping supplementation to the same level as before supplementation. (2) Cu contents in serum, RBC and hair increased significantly after 4 weeks supplementation and decreased at 4 weeks after stopping supplementation. Cu contents in 24h-urine did not change significantly during experiment. (3) RBC superoxide dismutase (SOD) activities were decreased persistently after 2 weeks supplementation and were not recovered at 4 weeks after stopping supplementation. RBC glutathione peroxidase (GPX) activities increased significantly after 4 weeks supplementation. The content of lipid peroxide (LPO) increased significantly after 2 weeks supplementation. (4) Total cholesterol (TC), triglyceride (TG), Low density lipoprotein cholesterol (LDL-C) and apolipoprotein B100 (ApoB100) increased significantly, high density lipoprotein cholesterol (HDL-C) and apolipoprotein A1 (ApoA1) decreased after supplementation. CONCLUSION: When healthy men received 50 mg Zn supplement per day, it might interfere Zn, Cu and lipids metabolism and inhibit antioxidation process. PMID: 15727190 [PubMed - indexed for MEDLINE]

- Blei und Haar



1: [Chemosphere](#). 2005 Mar;58(10):1385-90.



[Links](#)

Preliminary synchrotron analysis of lead in hair from a lead smelter worker.

- [Martin RR.](#)
- [Kempson IM.](#)
- [Naftel SJ.](#)
- [Skinner WM.](#)

Department of Chemistry, University of Western Ontario, London, Ontario, Canada N6A 5B7. rrrhm@uwo.ca
Synchrotron X-ray fluorescence has been used to study the distribution of lead in a hair sample collected from a lead smelter worker. A mathematical model was used to imitate the transverse scan signal based on the analysis volume and concentration profiles. The results suggest that the Pb originates both from ingestion and environmental exposure, however direct deposition from the environment is the more important source of hair lead. The model could apply equally to any other analysis involving a thin cylindrical sample.

PMID: 15686756 [PubMed - indexed for MEDLINE]

- Mangan und - Chrom Brust Krebs und

1: [Biol Trace Elem Res](#). 2004 Winter;102(1-3):19-25.



[Links](#)

Chromium and manganese levels in the scalp hair of normals and patients with breast cancer.

- [Kilic E.](#)
- [Saraymen R.](#)
- [Demiroglu A.](#)
- [Ok E.](#)

Department of Biochemistry and Clinical Biochemistry, Erciyes University, 38039-Kayseri, Turkey.

The adverse health effects linked with chromium and manganese and the diverse cellular and molecular effects of chromium and manganese make the study of chromium and manganese carcinogenesis and toxicology very interesting and complex. Quantitative elemental analysis of scalp hair of breast cancer patients (stage III) (n=26) and controls (n=27) were used to study to find correlation and possible changes between breast cancer and healthy controls. The graphite furnace atomic absorption analysis of quantitative method was used for the determination of chromium and manganese element levels. Comparison of mean elemental contents of the breast cancer patients with controls shows a significant enhancement of chromium (p<0.05) but declining trends for manganese (p<0.05) in breast cancer patients. Changes in element content in hair can serve as a guide to opening up new vistas in the treatment of breast cancer on the basis of an overall analysis of symptoms and signs.

PMID: 15621924 [PubMed - indexed for MEDLINE]

- Zink und Down Syndrom

1: [Downs Syndr Res Pract](#). 2004 Jul;9(2):53-7. [Links](#)

Hair zinc level in Down syndrome.

- [Yenigun A.](#)
- [Ozkinay F.](#)
- [Cogulu O.](#)
- [Coker C.](#)
- [Cetiner N.](#)
- [Ozden G.](#)
- [Aksu O.](#)
- [Ozkinay C.](#)

Adnan Menderes University, Faculty of Medicine, Department of Pediatrics, Aydin, Turkey.

Immunological, endocrinological, and haematological abnormalities are relatively common in people with Down syndrome (Cuadrado & Barrena, 1996; Decoq & Vincker, 1995; Hestnes et al., 1991; Sustrova & Strbak, 1994; Nespoli, Burgio, Ugazio & Maccario, 1993; Kempinski, Chessells & Reeves, 1997; Kivivuori, Rajantie, & Siimes, 1996; David et al., 1996; Gjertson, Sturm & Berger, 1999). Zinc is one of the elements that act in the maintenance of normal function of these systems. This study was designed to investigate zinc levels in children with Down syndrome. Zinc levels were measured in hair using atomic absorption spectrophotometry. The hair zinc level of 19 children with Down syndrome was compared with the zinc level of 11 typically developing children. Hair zinc levels were found to be significantly lower ($p < .05$) in those with Down syndrome (average 95.18 +/- 56.10 ppm) than in the typically developing children (average 208.88 +/- 152.37 ppm). Some of the problems experienced by children with Down syndrome may be due to these low zinc levels, but further research is required to confirm these results, and to establish any correlation with these problems.

PMID: 15332439 [PubMed - indexed for MEDLINE]



1: [Sci Total Environ.](#) 2004 Jul 5;327(1-3):81-92. [Links](#)

Scalp hair analysis as a tool in assessing human exposure to heavy metals (S. Domingos mine, Portugal).

- [Pereira R.](#)
- [Ribeiro R.](#)
- [Goncalves F.](#)

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Hair samples from the scalp were used in a preliminary assessment of heavy metals exposure ([As, Cd, Cr, Cu, Mn and Zn](#)) of the human population living near an abandoned cupric pyrite mine (Mina de S. Domingos, Southeast Alentejo, Portugal). In parallel with the collection of hair samples, individuals from two different communities at the South and North of the mine area answered a questionnaire designed to obtain information about potential exposure pathways to these elements. The questionnaire allowed data collection about the most frequently consumed foodstuffs, drinking water sources, smoking habits, alcohol consumption and health condition. Higher concentrations, and subsequently higher ranges, of Cd, Cu and As were recorded in individuals living near the mine (MSD group), in opposition to individuals living several kilometers apart. Additionally, the concentrations recorded in the hair of some individuals from the MSD group were above the reference values for non-exposed individuals, suggesting their enhanced exposure. However, no significant differences were found for the average concentration of these elements between villages. Individuals from the CP and SC groups presented significantly higher concentrations of Zn and Mn in scalp hair. These results were in agreement with the concentrations of these elements recorded in soil samples. The water supplies of the area do not seem to be potential sources of trace elements for human beings. In opposition, individuals that frequently consume milk and cheese obtained from cattle that usually breeds in the area presented significantly higher concentrations of As and Mn in their scalp hair. Our results suggest that the population of S. Domingos mine area and neighbour localities may be exposed to some of the elements analysed namely Mn and Zn. The most likely exposure pathways seemed to be animal foodstuffs, however, a more detailed analysis of these products, as well as garden vegetables and fruits, should be performed.

PMID: 15172573 [PubMed - indexed for MEDLINE]

- Kupfer Mangel

- Cadmium Intoxikation



1: [Eur J Clin Nutr.](#) 2004 Oct;58(10):1359-64. [Links](#)

Hair as a biopsy material: trace element data on one man over two decades.

- [Klevay LM.](#)
- [Christopherson DM.](#)
- [Shuler TR.](#)

United States Department of Agriculture, Agricultural Research Service, Grand Forks Human Nutrition Research Center, ND 58202-9034, USA. lklevay@gfhnrc.ars.usda.gov

BACKGROUND: Hair mineral analyses are being performed frequently both with and without medical advice. Reasons for analysis often are ill defined. OBJECTIVE: To assess variability of trace element data both within a series of samples from an individual and

among mean values published from other research laboratories. DESIGN: Many samples of hair were collected carefully from a healthy man over a comparatively long period of time and were processed and analyzed under standard conditions. Extensive published data from other research laboratories also were reviewed and compared. RESULTS: Coefficients of variation for trace elements in hair of the donor ranged from 17 to 74% for the essential elements copper, selenium and zinc and from 53 to 121% for the potential intoxicants aluminum, cadmium and lead. The ratio of high mean to low mean for values published by others on hair samples from healthy people ranged from two for selenium and zinc to 18 for aluminum. CONCLUSIONS: Hair analysis should be based on a diagnostic hypothesis such as cadmium intoxication or copper deficiency rather than on the ease of analysis or attempts to explain vague symptoms because within-person variability is large and interlaboratory agreement on normal values is poor.

- Chrom

1: [Int J Circumpolar Health](#). 2003 Sep;62(3):276-83. [Links](#)

Hair chromium concentration of northern Finns.

- [Soininen L](#),
- [Mussalo-Rauhamaa H](#),
- [Lehto J](#).

State Provincial Office of Lapland, Rovaniemi, Finland. leena.soininen@lh.intermin.fi

OBJECTIVES: The present study is a pilot project for the Finnish AMAP (Arctic Monitoring and Assessment Programme/Human Health) investigations. We examined the exposure of northern Finns to chromium (Cr), because analyses of this metal are not included in the AMAP, and local industry and industry throughout the Kola Peninsula may increase chromium fallout in Finnish Lapland. Chromium exposure and its temporal trend were estimated by analyzing hair of northern Finns collected in 1982 and 1991. METHODS: After washing the hair samples, chromium analyses were carried out in 1995 by a method developed by Salmela et al. (1981) and Kumpulainen et al. (1982). The Perkin-Elmer 5000 atomic absorption spectrometer used was equipped with a graphite furnace (HGA-400). RESULTS: Age showed no statistically significant correlation with Cr concentration in hair, but the hair concentration of Cr in men was higher than that in women, both among southern and northern Finns and Sami. CONCLUSIONS: Chromium levels in the hair of Finns and Sami were too low to result in any health hazard, however, exposure to chromium may have slightly increased during the 1990s.

PMID: 14594202 [PubMed - indexed for MEDLINE]

Frau B. Schweizer von der Sivita GmbH, Stählistrasse 12, CH-8280 Kreuzlingen schreibt:

HMA ist eine seit vielen Jahren bewährte und von der [WHO anerkannte Methode](#), um den Haushalt der Mineralstoffe und Spurenelemente zu untersuchen und um Schwermetallbelastungen zu ermitteln.

Tatsache ist: [Die WHO = Welt Gesundheitsorganisation – hat 292 Einträge zu Spurenelementen in Haaren:](#)

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Zurück

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[iAH Search interface 2.5.1 - Results of the search page 1](#)
... **Trace elements**, hormones, enzymes and protein fraction were determined in the blood serum ... iron, cadmium, cobalt and nickel in buffalo calves **hair** in relation ...
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[Eastern Mediterranean Health Journal, Vol. 5, No. 4-Lead, the ugly ...](#)
... Among these **trace elements** is lead ... Over a period of time, the lead is redistributed and accumulated in bone, teeth and **hair**, with a small quantity ... Lead **analysis**. ...
www.emro.who.int/Publications/EMHJ/0504/17.htm

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... abnormal spiral twisting of the **hair**, lax skin ... Balance studies, factorial **analysis**, daily intakes and biochemical ... **Trace elements** in human nutrition and health. ...
www.who.int/entity/water_sanitation_health/dwq/nutrientschap4.pdf

[PDF] [Selenium in Drinking-water](#)
... exposure are manifested in nails, **hair**, and liver. ... Radiochemical **analysis** of ground and surface water in ... Part I. Journal of **trace elements** and electrolytes in ...
www.who.int/entity/water_sanitation_health/dwq/chemicals/selenium.pdf
[More results from www.who.int/entity/water_sanitation_health/dwq/]

[PDF] [10. Selenium](#)
... of the complex meta- bolic role of this **trace** nutrient. ... The selenium contents of **hair** and of whole blood are ... selenium and cancer risk (33), an **analysis** of the ...
whqlibdoc.who.int/publications/2004/9241546123_chap10.pdf

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