



The Seronorm Trace Elements Controls

Accuracy controls and secondary reference materials with many applications

- Nutrition
- Occupational health
- Environmental health
- Toxicology
- Food safety
- Veterinary and biological studies

THE
INDEPENDENT
CONTROL SERA
SPECIALIST
1963-2013

50
- YEARS -

Occupational health

Cadmium in blood of Tunisian men and risk of bladder cancer: interactions with arsenic exposure and smoking

MolkaFeki-Tounsi et al A. Hamza-Chaffai Unit of Marine and Environmental Toxicology. IPEIS, University of Sfax, Tunisia.

Environ SciPollut Res (2013) 20:7204–7213 DOI 10.1007/s11356-013-1716-8

Prior investigations identified an association between low-level blood arsenic (As) and bladder cancer risk among Tunisian men but questions remain regarding by cadmium (Cd), a well-established bladder carcinogen. This study using AAS is the first to report the relationship between As and Cd exposure and risk of bladder cancer occurrence in interaction with smoking.

The analytical method was controlled by using external certified reference materials. Reference samples for whole blood (three levels, references 201505, 201605, and 201705) - Seronorm (SERO, Billingstad, Norway).

Food safety

Mercury in Canned Tuna in Spain. Is Light Tuna Really Light?

Montserrat González-Estecha et al. Trace Element Unit and Laboratory Medicine Department, Instituto de Investigación Sanitaria, Hospital Clínico San Carlos, Madrid, Spain.

Food and Nutrition Sciences, 2013, 4, 48-54

This study analyzed 36 cans of the most popular brands in Spain and examined the influence of the type of tuna, packaging medium (olive oil, sunflower seed oil, water or marinade), different brands, prices and expiration dates. Mercury concentrations (mg/kg) were measured by AAS. The mercury content was variable and high. The results of this study indicate that stricter regulation of Hg in canned tuna is necessary.

Internal quality controls (Seronorm® trace element levels 1 and 2) were assessed in every series of samples to check the reproducibility and accuracy of the measurements.

Nutrition

Zinc and Selenium Nutritional Status in Vegetarians

Maritsa Carla de Bortoli et al - University of São Paulo, Brazil

Biol Trace Elem Res (2009) 127:228–233 DOI 10.1007/s12011-008-8245-1

The aim of the present study was to assess the nutritional status of zinc and selenium in vegetarians in the city of São Paulo. Participants were recruited in Yoga schools. Selenium blood levels are adequate and zinc concentration in erythrocytes is deficient in the studied population. For this reason, vegetarians should

be constantly assessed and receive nutritional support to reduce the effects of inadequate zinc status.

Methods reproducibility was achieved by triplicated sample and double reading, and validity was performed with ... Seronorm Whole Blood® standards.

Dietary habits and selenium, glutathione peroxidase and total antioxidant status in the serum of patients with relapsing-remitting multiple sclerosis

Katarzyna Socha et al, Medical University of Bialystok, Poland

Biol Trace Elem Res (2009) 127:228–233 DOI 10.1007/s12011-008-8245-1

The aim of this study was to estimate selenium (Se) concentration, glutathione peroxidase (GSH-Px) activity and total antioxidant status (TAS) in the serum of patients with MS and the influence of dietary habits on the status. In this study patients with relapsing-remitting MS was compared to a healthy control group.

habits and adequate dietary intake of antioxidants in the diet may be one of the most important environmental factors for the prevention of Multiple Sclerosis (MS).

The concentration of Se in the serum was determined by the electrothermal atomic absorption spectrometry method with Zeeman background. Every day, certified reference material of human serum (Seronorm Trace Elements, Serum Level 1, 0903106, Sero AS, Norway) was used to test the accuracy of this method.

Serum Se concentration, GSH-Px activity and TAS value were significantly lower in patients with relapsing-remitting MS compared with healthy volunteers. Dietary

Toxicology

Application of ICP-OES to the Determination of Barium in Blood and Urine in Clinical and Forensic Analysis

Teresa Lech, Institute of Forensic Research, Krakow, Poland.

Journal of Analytical Toxicology, Vol. 37, issue 4, pp 222-226

Exposure to barium (Ba) mostly occurs in the workplace or from drinking water, but it may sometimes be due to accidental or intentional intoxication. This paper presents a reliable, sensitive method for the determination of Ba in blood and urine using ICP-OES. This method allows

the analysis of blood, serum and urine for Ba in people suspected of having been poisoned with Ba compounds.

The overall procedure was checked using Seronorm Whole Blood L-2 and Trace Elements Urine.

Environmental health

Biomonitoring of chromium for residents of areas with a high density of electroplating factories

Feng-Hsiang Chang, Division of Environmental Health and Occupational Medicine, National Health Research Institute, Zhunan, Taiwan

J. Exposure Analysis & Envir. Epidemiology 16, 138-146, 2006

The high density of electroplating factories in the geographic middle of Taiwan has prompted concern over the potential for exposure to harmful metals. The present study aimed to determine the levels of chromium in whole blood (B-Cr) of residents living in the high vs. low factory-density areas, and to examine the relations to gender and age. Chromium determinations (n=641) were made using a graphite furnace atomic absorption spectrometer. The B-Cr levels apparent in the blood samples collected from the high factory-density area were significantly higher than that of the control area.

Standard Reference Material (SRM), Seronorm™ Trace Elements Whole Blood (Lot MI1256, Billingstad, Norway) was used for QC evaluation.

Toxic trace elements in maternal and cord blood and social determinants in a Bolivian mining city

Flavia L. Barbieri et al,

International Journal of Environmental Health Research, Published online: 16 Jul 2015

This study assessed lead, arsenic, and antimony in maternal and cord blood, and associations between maternal concentrations and social determinants in the Bolivian mining city of Oruro. Women with lower educational level and women whose husband/partner/father was involved in mining activities were significantly more likely to be in the higher exposure category for all three toxic elements.

Quality control was performed ... two reference materials from SERO AS (Norway) -Seronorm Trace Elements Whole Blood, Level 1 and Level 2.

Veterinary and biological studies

Excessive lead burden among golden eagles in the Swiss Alps

Milena M Madry et al, Zurich Institute of Forensic Medicine, Department of Forensic Pharmacology and Toxicology, University of Zurich, Switzerland

Published 26 February 2015 • © 2015 IOP Publishing Ltd • Environmental Research Letters, Volume 10, Number 3

Fragments from lead ammunition pose a poisoning risk for predators like golden eagles that scavenge on non-retrieved carcasses or offal left behind by hunters. Three golden eagles were found in the Swiss Alps with an acute lead poisoning. In this IP-MS study golden eagles from Switzerland was compared to eagle owls from the same area and to their respective prey.

Bones of golden eagles contained 10 times more lead (median of 12.45 µg

g⁻¹ dry weight) than owl bones (1.28 µg g⁻¹), which represent substantially higher levels than previously reported for golden eagles.

Two different positive control samples served to verify the accuracy of the measurements: Human Hair Certified Reference Material No. 13 (National Institute for Environmental Studies, Japan), and Seronorm™ Trace Elements Whole Blood.

Speciation analysis using Seronorm™ TE products

Hg

Using Seronorm™ Whole Blood samples a specific GC-ICPMS method for analyzing methylmercury has been developed. This method has been used as a reference method for measuring methylmercury in whole blood.

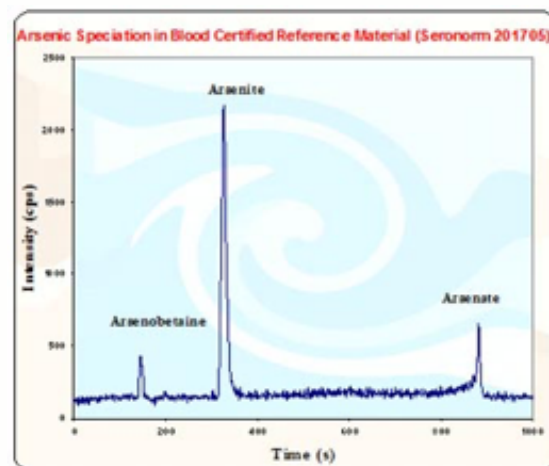
In 4 different batches of Seronorm™ Whole Blood methylmercury was measured to be in the range of 1.30 – 1.48 µg/L.*

* Methylmercury measurement in Whole Blood by Isotope-Dilution GC-ICPMS with 2 sample preparation methods. Douglas C. Baxter et al, Analytica AB, Luleå, Sweden. Clinical Chemistry 53:1 111-116 (2007)

As

Speciation analysis with ICP-MS show that arsenobetain is the dominant arsenic species in normal donor blood samples. In Seronorm products other arsenic species are present.

Image courtesy of Brooks Applied Labs (www.brooksapplied.com), Seattle, USA.



The Seronorm Trace Elements Controls

- Accuracy controls and secondary reference materials for the analyses of trace elements and heavy metals in serum, urine or whole blood.
- Product quality is ensured through careful selection and handling of raw materials and strict production procedures. No preservatives or stabilizers are added.
- Lyophilized material with an excellent shelf life (serum and urine – 7 years, whole blood – 5 years). After reconstitution, the material is stable for 1 month at -20°C or 7 days at 2-8°C.
- Product documentation includes analytical data for more than 60 analytes. The independent analytical values are traceable to international reference materials.
- Available in two (serum and urine) or three (whole blood) clinically relevant levels – each level is available separately. Contact SERO for package inserts of currently available lots to evaluate target levels.



Seronorm™ Trace Elements Serum



Seronorm™ Trace Elements Whole Blood



Seronorm™ Trace Elements Urine

Overview – certified values in Seronorm™ Trace Elements Controls

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■ Available in Serum, Whole Blood, Urine
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- Additional toxic elements available in Seronorm™ Trace Elements Urine: formic acid, mandelic acid, 1-hydroxypyren, phenol, tetrachloroethylen, trichloroacetic acid.
- Additional element available in all Seronorm™ Trace Elements controls: fluoride.

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