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
Occupational health

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

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


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, Billington, 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


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 Białystok, Poland


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.

Serum Se concentration, GSH-Px activity and TAS value were significantly lower in patients with relapsing-remitting MS compared with healthy volunteers. Dietary 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, Seror AS, Norway) was used to test the accuracy of this method.

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 L2 and Trace Elements Urine.
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.

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.

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.*


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.
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.

Overview – certified values in Seronorm™ Trace Elements Controls

- Available in Serum, Whole Blood, Urine
- Available in Serum, Whole Blood
- Available in Serum
- Available in Whole Blood, Urine

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.