

## Cadmium and Pb Determination by GFAAS in Male Rats after Tobacco Smoke Exposure – A Passive Smokers Study

Fabiana G. Christovão<sup>b</sup>, Edivan C. Vieira<sup>c,d</sup>, Bruna F. Garcia<sup>b</sup>, Ana Rita A. Nogueira<sup>c</sup>

Elma Neide V. M. Carrilho<sup>a,\*</sup>

<sup>a</sup>Departamento de Zootecnia, FCAV/UNESP, Jaboticabal - SP, Brazil  
elmavm@fcav.unesp.br

<sup>b</sup>Departamento de Farmacologia e Fisiologia Animal, FCAV/UNESP, Jaboticabal - SP, Brazil

<sup>c</sup>Embrapa Pecuária Sudeste, São Carlos - SP, Brazil

<sup>d</sup>Departamento de Química, Universidade Federal de São Carlos, São Carlos - SP, Brazil

In tobacco smoke, a great number of different substances are usually found, including heavy metals, which usually exhibit major toxicity to human<sup>1</sup>. In addition to active tobacco smoking, passive smoking has been converted to a serious problem in public health<sup>2</sup>. Therefore, researches have demonstrated severe effects that tobacco causes to the health of active and passive smokers<sup>3</sup>. Lead and Cd are potential toxic elements in human tobacco smoke exposure. However, determination of these metals in biological samples poses several problems, mainly due to their low concentrations and contamination. Therefore, the analytical method to be used for destruction of the organic matter and extraction of the analyte requires minimal sample handling and low detection limits<sup>4</sup>. This study aims to investigate levels of Cd and Pb in liver, kidneys, and blood of 20 male rats, after exposing the animals for 45 days, 8-hours/day, 7 days/week, to tobacco smoke in a vented 16 m<sup>2</sup> room. A control group was treated in identical fashion but only exposed to room air, cigarette smoke free environment. At the end of the study period, blood and tissue samples were freeze-dried and prepared by microwave decomposition employing 2 mL of 7 mol L<sup>-1</sup> HNO<sub>3</sub> and 1 mL of 30 % v/v H<sub>2</sub>O<sub>2</sub>, under high pressure and temperature. This preparation method allowed sample solubilization with low risks of analyte losses by volatilization as well as reduced chances of contamination. A Varian Model AA 880 atomic absorption spectrophotometer with Zeeman-effect background correction was used for Cd and Pb determination. Pyrocoated graphite tubes were used and measurements were performed at 283.3 nm Pb and 228.8 nm Cd analytical lines. Pyrolysis and atomization temperatures for Pb were 400 °C and 2100 °C while for Cd were 450 °C and 2300 °C, respectively. For all samples investigated, no remarkable differences were observed in Pb contents between test and control groups. These results indicate that no contamination of this metal can be suggested at this level of exposure. However, for Cd, significant difference was found in kidneys: 15.5 ± 1.5 and 43.8 ± 0.7 µg kg<sup>-1</sup> in control and test groups, respectively. Cadmium contamination was not noticed in the remaining samples.

### References

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