

## The Dog as a Passive Smoker: Effects of Exposure to Environmental Cigarette Smoke on Domestic Dogs

Marcello Rodrigues Roza, Sc.M. and Carlos Alberto Assis Viegas, Ph.D.

Centro Veterinário do Gama

Department of Pneumology, University of Brasilia Brasilia, Brazil

Correspondence: Marcello Roza Quadra 22, Casa 147, Gama Leste, Brasília, DF, Brasil, CEP 72460-220. Tel: +1 55(61) 99876544; Fax: +1 55(61) 33847887; E-mail: marcelo.roza@apis.com.br

### Abstract

Of the few studies available regarding the effects of smoking on animals, most of them involve animals actively smoking through the use of a mask or tracheostomy. The present study investigated the effects of passive smoke exposure on domestic dogs.

The sample comprised 30 Yorkshire terriers (18 males) ranging in age from 27 to 106 months ( $M=38.6\pm15.8$ ) and weighing 1.9-4.0 kg ( $M = 3.04\pm0.48$ ). Half of the dogs came from homes where residents smoked at least 20 cigarettes/day for a minimum of 24 months, and the other half were from homes without smokers.

All animals were subjected to bronchoalveolar lavage to determine cell populations and the presence of anthracosis in macrophage cytoplasm; in addition, a carinal biopsy was obtained. To characterize environmental cigarette smoke exposure, urinary cotinine was determined by an immunochromatographic assay.

Cotinine was not detected in the urine of dogs not exposed to cigarette smoke, whereas exposed dogs tested positive. In dogs exposed to cigarette smoke, macrophage and lymphocyte populations were significantly increased ( $p<.05$ ) and anthracosis was present in the cytoplasm of macrophages.

The measurement of urinary cotinine by an immunochromatographic assay is an effective method that can be used to confirm environmental tobacco exposure. Cytological analysis of bronchoalveolar lavage fluid demonstrated airway alterations triggered by passive exposure to tobacco smoke in domestic animals.