

Use of the CALUX[®] bioassay for dioxins in an incinerator biomonitoring program

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The CALUX[®] bioassay for dioxins, a reporter gene based detection system, was included in an ongoing municipal solid waste incinerator biomonitoring program. As part of the program, that started prior to the operation of the incinerator (1989), environmental contaminants in nearby wading bird colonies, eggs and nestlings of anhingas (*Anhinga anhinga*) and white ibises (*Eudocimus albus*), have been monitored. In this study, samples analyzed for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and 2,3,7,8-tetrachlorodibenzofuran (TCDF) by gas chromatography/mass spectrometry were also analyzed using the CALUX[®] bioassay. The results for the CALUX[®] bioassay averaged 40 times higher than the chemical analysis results. This probably results from the fact that the CALUX[®] bioassay detects all 17 active dioxin/furan congeners as well as mixed halogenated congeners while the chemical analysis results were based on only two congeners. In spite of these differences, a correlation was observed between the chemical analysis and CALUX[®] results (0.67 and 0.61 for anhinga and white ibis respectively). Samples were also analyzed from a colony located in the Everglades. This colony was more remote from possible sources of contamination and as suspected the results for the CALUX[®] bioassay were lower than was seen in the colonies near the incinerator (3.1 versus 11.7 pg/g wet weight). However, there is no indication that the incinerator is contributing to this contamination as the TCDD/TCDF levels remain at the pre-operational levels. These results suggest that the CALUX[®] bioassay can be used to analyze biological samples and can provide data that is consistent with the more costly and time consuming chemical analysis methods for detection of dioxins.