## A15    The Development of Field Calibrants for Detection Canines

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After attending this presentation, attendees will learn the odors associated with illicit materials as well as the validation strategy of surrogate continuation aids that can be used to train biological detectors, such as canines.

This presentation will impact the forensic community by demonstrating how a detection canine can be as objective and reliable as a laboratory instrument.

The goal of this study was to aid in the standardization of detection canine training and handling through the use of field calibrants. Field calibrants, or surrogate continuation aids, are becoming more common in the field since obtaining and maintaining detection canine training aids can be problematic and require adherence to rules and regulations that may be beyond the capabilities of the agency maintaining the canine team. Ideal field calibrants overcome these commonly encountered challenges by having inert compositions not subject to the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) and Drug Enforcement Administration (DEA) terms and conditions. Field calibrants are also advantageous because they can be selected and manufactured in such a way that a known and controlled quantity of odor is released with minimized contamination concerns ensuring standardized training aids over their specified lifetime.

Biological detectors such as canines are valuable tools used for the rapid identification of illicit materials because they can be trained to reliably detect a wide variety of odors. However, recent increased scrutiny over the reliability of detection canines is currently being evaluated in the legal system as there are no formal regulations regarding detection canine maintenance and training. Best practices guidelines covering the various aspects of canine and orthogonal detectors for consistent and optimal practice among canine handlers have been established by the Scientific Working Group on Dog & Orthogonal Detector Guidelines (SWGDOG). SWGDOG has also outlined areas of needed research including the identification of odors associated with illicit materials and the validation of surrogate continuation aids, both of which are addressed in this study.

Previous studies have identified the dominant odor compounds of several illicit materials, which has led to the development of surrogate continuation aids. Dominant odor compounds can be defined as the chemical compound or compounds identified in the headspace of the illicit material which, when exposed to the biological detector, induce an alert response. For example, methyl benzoate and 2,4-dinitrotoluene have been identified as the dominant odor compounds of cocaine and trinitrotoluene (TNT), respectively. This study deals directly with the steps taken for the validation of surrogate continuation aids and a Universal Detector Calibrant (UDC). Validation steps for these field calibrants include: the identification of the dominant odor compounds of the illicit material, the development of a surrogate continuation aid, field testing the surrogate continuation aid using trained and certified detection canines, substitution of the surrogate continuation aid into the initial training stages of the detection canines, and finally, the implementation of the surrogate continuation aid into daily training.

The development of a UDC provides one measure to evaluate the reliability of the biological and instrumental detectors. Currently there are no set practices to ensure that a biological detector is working at a reliable and suitable level on a daily basis. As instruments in a laboratory are calibrated to ensure that they are in proper working order, developing a UDC for which biological detectors can be calibrated would be useful. By training the canine to alert to the UDC before each working day, the handler can record if the biological detector is working to a suitable standard. The UDC has the potential to also be used in selecting future biological detectors by determining the time it takes to train the canine to alert to the compound and the sensitivity of detection that the canine can achieve. Standardization of detection canine training aids will ensure the optimal number of illicit material odors detectable in the most reliable manner. Implementation of field calibrants into daily detection canine training will improve the reliability of the canine by allowing for the direct comparison of other biological detectors as well as orthogonal detectors.

**Detection Canines, Training Aids, Calibration**