A74 Validation of a Prototype Surrogate Explosives Kit as a Tool for the Enhancement of Explosive Detection Canine Training

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After attending this presentation, attendees will understand the steps taken for the validation of the prototype surrogate explosives kit that provides a less hazardous and more controlled delivery of explosive odorants. Attendees will also learn that the validated prototype explosives kit provides an additional tool for canine handlers to use

reducing the risk to the detector teams and increasing the number and consistency of target odors used for training.

This presentation will impact the forensic science community by providing a tool which gives access to more uniform training materials, improves the reliability of biological detectors, and allows for direct comparisons to other biological detectors as well as electronic detectors. Standardization of detection canine training aids will ensure that the maximum number of explosive odors are detectable in the most efficient and reliable manner.

Detection canines are commonly used in explosives detection and have been proven to be valuable assets for the rapid detection of an explosive odor. Detection canines are the most common and widely accepted biological detectors due to the ability of canines to quickly and reliably locate the source of an odor to which they are trained. The goal of this study is to outline the steps taken for the validation of a prototype surrogate explosives kit that provides a less hazardous and more controlled delivery of explosive odorants.

Recent research has been conducted in determining the dominant odor signatures of explosives resulting in the development of a prototype explosives kit containing a small number of proposed mimics that can be used to more consistently train a biological detector. The prototype explosives kit contains only non-controlled substance mimics previously demonstrated to be dominant odor compounds used by biological detectors to reliably locate the majority of target explosive materials.

The validation of the prototype explosives kit has several aspects which will be directly dealt with. The first is to prove that previously certified detector canines will alert to all of the compounds found within the prototype explosives kit. This step is necessary to validate the functionality of the kit as the kit contains only non-controlled mimics of the minimum set of mandatory explosives along with plastic and nitroglycerin containing explosives. Explosive canines with no previous exposure to the compounds in the kit should alert to all of the compounds as long as they were trained on the real explosives mimicked within the kit. To date, previously certified detector canines have had a positive range of alert rates to aids contained within the prototype surrogate explosives kit. The second aspect is to train green canines for explosives detection only using the mimics within the prototype explosives kit. Once successfully trained to the odors in the training kit, double blind field trials are used to test the handler/canine team's ability to alert to actual explosive material. After testing a small number of canines, a 100% alert rate has been achieved for the detection of real explosive material. The next aspect is to determine the efficacy of detection between explosive materials vs. commercial explosive materials vs. developed explosive mimics/pseudos. There has been long standing debate over the use of real explosive material versus mimics/pseudos. This experiment shows which, if any, of the materials are superior through double blind odor recognition tests with previously certified explosive canines. Testing materials include: real explosives, NESTT training aids, NIST pseudo training aids, and explosive mimics used in the prototype explosives training aid kit.

The validated prototype explosives kit provides an additional tool for canine handlers to use that reduces the risk to the detector teams and increases the number and consistency of target odors used for training. Access to more uniform training materials improves the reliability of biological detectors and allows for direct comparisons to other biological detectors as well as electronic detectors. Standardization of detection canine training aids will ensure that the maximum number of explosive odors are detectable in the most efficient and reliable manner.

Detection Canines, Explosives, Training Aids