Introduction

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T), in its continued support of the working dog community, sought to examine the impact of abrupt search starts (and the often notable changes in environmental setting/conditions as a result) on detection canine performance.

Dogs in the study were trained and housed under comfortable conditions (72°F, 60% RH) but tested under a range of temperature and humidity combinations (32°F to 104°F and 40% RH to 85% RH). Each test began with the dog held under the comfortable conditions, then rapidly introduced into an extreme environment to conduct a search – similar to moving quickly from a climate-controlled patrol car to a vehicle search as part of a traffic stop. Detection responses were repeatedly measured so that time dependent performance could be tracked.

Key Findings

- Performance remained high when transitioning quickly into cold extremes. Oppositely, although the dogs appeared to work well in the hot/low humidity and warm/humid conditions, their performance was adversely impacted.
- Moving higher on the heat/humidity index, dogs unaccustomed to hot/humid conditions showed a substantial reduction in search behavior and performance in those extremes.
- Dogs take several moments to fully engage in a search, and performance during those first moments is reduced (i.e., a ‘warm-up period’ does exist, and was present even when moving from comfortable hold conditions to comfortable test conditions!).

Recommendation #1:

Canines should be allowed a “pre-search” to mitigate any adverse effects of the warm-up period:

1. Settle the canine into the environmental conditions – allow them to roam/break.
2. Work the canine as much as 2 to 5 minutes before entering the critical area (this could include the exterior of a building, or several neutral vehicles, before arriving at the targeted vehicles).
3. When feasible and permitted, employ the common practice of a drop aid - where a target/training aid is knowingly present in the pre-search area to motivate and check on the canine.

Recommendation #2:

Canines should be trained and evaluated under all environmental conditions in which they will work.

1. Systematic exposure and conditioning to the local environment are essential.
2. Collect the heat index rating at the start, end, and throughout the day; exert caution if the heat index exceeds conditions under which the canine has not been formally evaluated as decrements may exist.
3. Even with these precautions, note that performance under extreme conditions may be lowered even when canines exhibit adequate search behaviors.

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