

Are your training samples giving you the capability you expect?

What is this note about?

This note provides key advice on how to ensure that training samples (odour samples used for training and/or assessment of detection dogs) are fit-for-purpose and actually facilitate the intended operational capability.

Who is this note relevant for?

- Anyone choosing training samples for the training and/or assessment of detection dogs.
- Anyone commissioning detection dog services.
- All detection dog trainers and assessors.

What is a Training Sample (TS)?

TSs are scent-emitting substances used to teach dogs to respond to particular targets. They may also be used for continuation training (ensuring that dogs do not forget the odour over time) and also to test dogs to ensure their suitability for operational deployment.

A TS might comprise:

A sample of the real target, representative of that likely to be encountered operationally:

- E.g. a sample of recovered drugs, commercial explosive or wildlife scat.

A sample of the real target contained in, or absorbed on, a low-odour matrix material:

- This can be a practical alternative where safety and/or legislative factors prevent use of the real target as it would be found in the field.
- Example low odour matrix materials include: wax, glass fibre filter papers, silica, or kieselguhr. Wherever such matrix-based training samples are used, a blank, but otherwise equivalent, sample should also be used in training and testing to ensure the dog is training on the target odour and not some other scent associated with the matrix or manufacturing process.

A simulant comprising a key component of the real target:

- E.g. benzocaine anaesthetic as a simulant for drugs mixed with benzocaine; ammonium nitrate selected as a non-explosive simulant for ammonium nitrate-based explosive mixtures.

N.B. "Pseudo-scents", i.e. simulants / TSs purportedly designed to smell like a target material or key component but not actually containing those materials, are not scientifically proven to be effective for detection dog training; their use is therefore **NOT** recommended.

Why is it important to assure and validate TSs?

In some instances, detection dogs are both trained and tested using exactly the same TSs rather than testing with a different sample. Such an approach to testing simply demonstrates that the dogs can find the specific TS they have trained on. No conclusions can be drawn as to whether the dogs would be likely to find other samples or the operational target material odour.

The dogs may be responding to contamination present in, or on, the TS rather than the target material/ odour. Alternatively, the TS may not be sufficiently representative of the target material/odour.

Problems with TSs arise from:

- a. Poor manufacturing or supply chain practices
- b. Inappropriate storage, handling and use by end-users resulting in contamination, ageing or degradation

Selecting and procuring TSs

Users should ensure that any TS selected for procurement has been:

- a. *validated* to confirm that training on it will contribute to ensuring that dogs can find the target in an operational search;
- b. *quality assured* by appropriate laboratory analysis to confirm it:
 - comprises the expected substances (and does not contain any unexpected substances)
 - is consistent within and between batches
 - ages / degrades consistently and as expected for specified shelf-life and storage regime
 - does not become contaminated during storage (e.g. due to inadequate/inappropriate packaging materials/containers)

Any blanks or controls should match the positive TSs in all respects, except they should be free from target odours.

When procuring a TS, it is good practise to ask suppliers to provide robust (preferably independently verified) evidence that the above validation and quality assurance testing has been completed.

A suggested protocol for validation testing of training samples is provided in Annex A. Conducting such testing to a scientifically rigorous standard may not be proportionate for an individual detection dog service provider but could be expected of a TS manufacturer.

Using TSs - how to ensure your TSs remain effective

Having procured TSs that are validated and quality assured, it is essential to ensure that their quality – and hence canine detection capability – is not compromised.

- Always follow manufacturer’s instructions regarding storage, handling, use and shelf-life of TSs.
- Take appropriate and robust measures to prevent contamination during storage, handling and use. For example, use multiple layers of odour-impermeable packaging materials for storage; do not store particularly high odour TSs in the same container or in close proximity to others; change disposable gloves between handling different TSs; and / or use single-use disposable tongs as appropriate (see the “Why and How to Control Contamination” guidance note [1], available on the CPNI website, for more information about packaging and contamination control).
- If it is suspected that a TS has become contaminated, it should be safely disposed of and replaced.
- Use appropriate blanks and interferents frequently as part of the training regime and assessment process, e.g. to ensure that dogs are not simply responding to odour associated with packaging materials or disposable gloves worn when handling the TSs.
- Always assess dogs on different samples to those used for training. This may be a sample from the same type of material but should ideally be sourced from different batches and if possible stored in a different location.

Annex A.

A protocol for validation testing to confirm that a TS enables dogs to find the intended target

Whatever form a TS takes, users should ensure that it has been validated to confirm that training on it will contribute to ensuring that dogs can find the target in an operational search. Where possible, validation tests should be conducted with dogs that have never before been trained on any type of TS for the particular target.

It is advisable to use a minimum number of 6 dogs to validate a TS. However the more dogs that are used, the more confident you can be in the results (using more dogs accounts for individual differences that are likely to exist between dogs).

Each new TS should be presented to each dog at least five times [2]. Five repeats are necessary to ensure statistical validity of the results and ensure that each dog's detection rate did not occur by chance.

The timescales for training a dog on a specific target will in part be dependent on the material itself; some materials may have relatively low amounts of odour coming off them and therefore take longer, or be harder, to train a dog to detect. Timescales will also partly be dependent on the experience of the dog handler team. However, both the baseline and final testing detailed below typically takes approximately 1 hour per dog.

Ideally, validation tests of any TS should involve the following three stages:

- 1. A baseline test:** to determine how dogs respond to the TS (and operational targets, if possible) before they have received any training on the samples.
 - Dogs should be tested on at least one sample of the real target to see whether they respond to it.
 - » This must not be the TS. If the TS is a sample of the real target, it is preferable to use a different variant, such as a sample obtained from a different source.
 - » Using as many different variants of the target as possible will give a better indication of how effective the TS is.
 - Dogs should be tested to see whether they respond to the TS.
 - Dogs should be tested to see whether they respond to any blank/control samples that are provided with the TS.
 - See the “Canine Odour Discrimination Test” guidance note [3] for advice on how to set up and run the test. See the “Why you should train and test detection dogs ‘double-blind’?” guidance note [4] for information on how to conduct double-blind testing and training.
- 2. A training phase**
 - After the baseline test, dogs should be trained to respond to the TS.
 - Blanks/controls should be used frequently throughout to ensure that dogs learn to ignore odours associated with the packaging or make-up of the TS.
- 3. A final test:** this should be a repeat of the baseline test. The dogs’ responses to the substances in the final test will be compared against their results from the baseline test to determine whether the training aid has been successful.
 - Dogs should be exposed to the TS (to confirm that they have successfully learned the TS odour).
 - Dogs should be exposed to any blank/control samples that were provided with the TS (to confirm that they have learned to respond to the target odour and not any odours associated with the packaging or make-up of the TS).
 - Dogs should be tested to see whether they respond to at least one sample of the real target.
 - » This must not be the TS. If the TS is a sample of the real target, it is preferable to use a slightly different variant, such as a sample obtained from a different source.
 - » Using as many different variants of the target as possible will give a better indication of how effective the TS is.
 - See the “Canine Odour Discrimination Test” guidance note [3] for advice on how to set up and run the test. See the “Why you should train and test detection dogs ‘double-blind’?” guidance note [4] for information on how to conduct double-blind testing and training.

The results of the final test (stage 3) conducted after training will be compared against the results of the baseline test (stage 1) to determine whether or not the TS has been successful.

The TS has been successful if:

- The dogs respond more reliably to the TSs and targets during the final test than the baseline test, and the dogs meet or exceed the required standard when detecting the targets.

The TS has been unsuccessful if:

- The dogs respond reliably to the TS but not the samples of real/operational targets:
 - » The TS may not be a valid representation of the real target odour.
 - » The TS may have become contaminated during use, leading to dogs recognising it by the contamination odour.
- The dogs respond to the TS but also respond to the blanks (items which match the positive TSs in all respects, except they should be free from target odours; e.g. clean target packaging layers):
 - » Further training may be required to ensure that they learn to differentiate between their TS and the blanks.
 - » The blanks samples could be contaminated with the TS odour.
- The dogs respond to neither the TS nor the samples of targets:
 - » It is likely that the dogs were not successfully trained on the TS and require further training time before a repeat of the final test.

Q. What if I can't get access to real target material recovered from the field?

A. You will not have the same level of confidence as testing on the real target; but you could test on fresh TSs or test on different brands of validated and quality assured TSs for the same target.

Associated Guides and Information

- [1] Why and how to control contamination DSTL/PUB89644
- [2] Porritt, F., Mansson, R., Berry, A., Cook, N., Sibbald, N., Nicklin, S. (2015). Validation of a short odour discrimination test for working dogs. Applied Animal Behaviour Science, 165, 133-142.
- [3] Canine Odour Discrimination Test DSTL/PUB89074
- [4] Why you should train and test detection dogs 'double-blind' DSTL/PUB104178

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