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**Standard for Collection of Known DNA Samples  
from Domestic Mammals**



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# Standard for Collection of Known DNA Samples from Domestic Mammals

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## Foreword

This standard presents protocols for collecting DNA samples for use in genetic analysis of domestic mammals.

The American Academy of Forensic Sciences established the Academy Standards Board (ASB) in 2015 with a vision of safeguarding Justice, Integrity and Fairness through Consensus Based American National Standards. To that end, the ASB develops consensus based forensic standards within a framework accredited by the American National Standards Institute (ANSI), and provides training to support those standards. ASB values integrity, scientific rigor, openness, due process, collaboration, excellence, diversity and inclusion. ASB is dedicated to developing and making freely accessible the highest quality documentary forensic science consensus Standards, Guidelines, Best Practices, and Technical Reports in a wide range of forensic science disciplines as a service to forensic practitioners and the legal system.

This document was revised, prepared, and finalized as a standard by the Wildlife Forensics Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Wildlife Forensic Biology of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

Questions, comments, and suggestions for the improvement of this document can be sent to AAFS-ASB Secretariat, [asb@aafs.org](mailto:asb@aafs.org) or 401 N 21st Street, Colorado Springs, CO 80904.

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**Keywords:** *DNA sample collection, domestic mammal, dog, cat, horse, cattle, pig, sheep.*

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# Standard for Collection of Known DNA Samples from Domestic Mammals

## 1 Scope

This standard provides the protocol for obtaining genetic known evidence samples (i.e., buccal swabs and pulled hair) for the purpose of genetic analysis from domestic animals such as dogs, cats, or livestock. This standard does not address sampling of non-domestic animals.

## 2 Normative References

There are no normative references. Annex A (Bibliography) contains informative references.

## 3 Terms and Definitions

For purposes of this document, the following definitions apply.

### 3.1

#### **buccal swab**

A cotton swab or similar collection substrate; used in a relatively non-invasive sample collection technique for scraping the inside of a mouth to collect cells from the inner cheek lining; this is a common method for collecting and preserving samples for DNA testing from known individuals.

### 3.2

#### **chain of custody**

Chronological record of the handling and storage of an item from its point of collection to its final return or disposal.

### 3.3

#### **known sample**

Biological material for which the identity of the donor is established and used for comparison purposes.

### 3.4

#### **nuclear DNA**

The DNA inside a cell's nucleus, existing in the form of chromosomes.

## 4 Requirements

### 4.1 General

**4.1.1** All known evidence samples shall be assigned a unique name or number.

**4.1.2** All required paperwork (e.g., submission forms, chain of custody forms) shall be completed.

**4.1.3** Pertinent information, such as sample collector, collection date and site, sample type (e.g., buccal swab, hairs), swab type, sample storage conditions, etc., shall be recorded.

## 4.2 Buccal Swabs

**4.2.1** Buccal swabbing using cotton, nylon, or other swab types is the preferred method for collecting DNA from domestic cats and dogs. Buccal swabs should be sterile.

NOTE While many swab types are acceptable for buccal swabbing, cotton swabs can sometimes be problematic for buccal collection from dogs.

**4.2.2** The collector shall complete the following.

- a) Isolate any animal(s) to be tested from other individuals (including nursing animals) and remove food and water at least 30 minutes prior to sample collection.
- b) If buccal swabs from more than one animal will be collected, complete the process for one animal and change gloves or clean hands before collecting from the next.
- c) Use at least two buccal swabs per animal to obtain replicate samples.
- d) Prepare a paper envelope or other container for each animal. Label it so as to uniquely identify the animal from which the sample is collected.

NOTE Other packaging options may be appropriate as long as buccal swabs are stored in a way that minimizes mold, bacterial growth, and sample degradation.

- e) Open the swab packaging and remove the swab by its handle.
- f) Place the head of the swab against the inside of the cheek and gums, and swirl/wipe vigorously eight to ten times.
- g) Allow the swab to dry in a clean environment, unless cells/swabs are directly transferred to a different storage medium (e.g., preservative liquid, preservative paper).
- h) Place the dry swabs in the labeled envelope (or equivalent). Seal the envelope and sign and date the seal.

NOTE Dry swabs may be stable at room temperature, however refrigeration is recommended for short term storage (days to weeks) while freezing is recommended for longer term storage.

## 4.3 Pulled Hair

**4.3.1** Pulled hairs with roots are the preferred DNA source for domestic mammals other than cats and dogs. Because nuclear DNA is only present in high quantities in the root of the hair, cut hairs are not acceptable.

**4.3.2** The collector shall complete the following.

- a) If hairs from more than one animal will be collected, complete the process for one animal and change gloves or clean hands (and pliers or similar if used) before collecting hairs from the next.
- b) Prepare a paper envelope or other container for each animal. Label it so as to uniquely identify the animal from which the sample is collected.

- Package loose hairs in a paper fold or adhere to a sticky note fold, and then place in the labeled envelope (or equivalent). Seal the envelope, sign, and date the seal.
- Alternately, place hair in the labeled envelope (or equivalent). Seal all corners of the envelope to prevent loss and sign and date the seals.

NOTE Other packaging options may be appropriate as long as hairs are stored in a way that minimizes mold, bacterial growth, and sample degradation.

- c) Collect thick hairs such as those from the mane, tail, or fetlock (base of leg just above the hoof). The area on the animal from which hairs are collected should be dry. If dirt or debris is present, brush the area to remove it.
- d) Use fingers or pliers (or similar) to grasp hair close to the skin and pull approximately ten hairs at once (do not cut hairs). Repeat this until 20 to 30 hairs with roots have been obtained.

NOTE For pigs, which have very thick hairs, five to ten hairs with roots are sufficient.

- e) Place the hairs in the labeled envelope (or equivalent). Seal the envelope and sign and date the seal.

NOTE Hairs may be stable at room temperature if kept dry and free from pests (e.g., Dermestidae beetles), however refrigerated or frozen are also acceptable storage conditions.

## **Annex A** **(informative)**

### **Bibliography**

The following bibliography is not intended to be an all-inclusive list, review, or endorsement of literature on this topic. The goal of the bibliography is to provide examples of publications addressed in the standard.

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<sup>1</sup> <https://doi.org/10.1093/jhered/esg004>





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