

Collection of hair samples for DNA testing

Background

Samples containing a nucleus, and hence DNA, provide a suitable target for genotyping. The optimal choice of sample for a commercial test however depends on the following factors:

- ease of collection
- cost of transport
- cost of processing
- reliability

The hair root is the preferred sample for genetic testing because it is the most cost efficient sample-type to collect and process. It is also the sample of choice for any bovine genotyping as it avoids the complication of haemopoietic chimerism, which is common with bovine twins. *This phenomenon occurs when haemopoietic stem cells from one twin colonise and establish in the other twin in utero. Subsequent genotyping tests may then be inaccurate if based on DNA isolated from blood of the twins. Such a DNA source will reflect the genotype of the twin whose stem cells dominated the co-twin, not the true genotype of the co-twin. However, this is the basis for the condition known as freemartinism and therefore only a blood sample can provide accurate results. Hence, if freemartinism is the test selected a blood sample must be provided from the female twin, otherwise, hair samples are suitable and preferred for all other tests.*

Scope

To provide submitters with clear instructions on the correct procedure for the collection of hair roots for DNA typing

An uncontrolled version of the sampling procedure, and AQIS permit for importation of hair roots, are available for forwarding to submitters on request.

Procedure

A detailed procedure for the collection of bovine hair roots is given on pages 2 and 3.

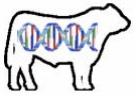
It is recommended that submitters include with the paperwork, information detailing their name, address, fax/phone, species and breed of subject(s), and test(s) required preferably on the Genetics submission form (DNAW1-011).

Average turn-around time is one week from date of receipt of specimens at the laboratory (does not apply to batch-rate submissions).

Overseas submissions

Samples originating from countries other than Australia must be heat-treated at 70°C for 15 mins prior to dispatch. Overseas submissions must include a copy of the Australian Quarantine Inspection Service (AQIS) permit and a declaration by a veterinarian indicating the samples were heat-treated as required. This information must be presented in a plastic sleeve on the outside of the package.

The AQIS permit number for the importation of hair roots is 200402303, valid from 05 February 2004 to 05 February 2006, and is entitled: *Permit to Import Quarantine Material*. A Declaration sheet is also available to fax with the permit, to assist submitters meet the import requirements.



PROTOCOL FOR COLLECTION OF HAIR SAMPLES FOR GENETIC TESTING

Background

Tests for genetic diseases or production traits in livestock are based on DNA, and the easiest source of DNA to collect and transport is the hair root.

Sample

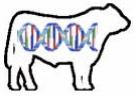
DNA is contained in the root of the hair, not in the shaft itself. It is therefore essential that the hair roots (which are clearly visible as bulbous protrusions) are attached to the plucked hairs submitted for DNA analysis.

SHORT, FINE BODY HAIRS ARE NOT SUITABLE FOR DNA ANALYSIS.

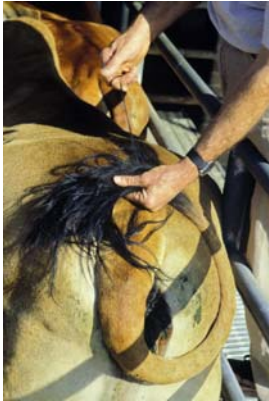
Collect long, thick hairs from
the switch/brush of the tail.



It is important that hairs submitted for DNA analysis are clean and dry. Moisture, combined with faecal contamination, which is difficult to avoid in some instances, degrades the DNA, impacting on our ability to obtain a result. If moisture cannot be avoided, transfer the hairs to a freezer ASAP to inhibit bacterial and fungal growth.



Sampling procedure



1. Select 10-20 tail hairs and tie a knot in mid shaft. Wrap the knotted hairs around your finger, and pluck with a rapid, sharp motion. Repeat the procedure to obtain about 30 to 40 hairs.
2. The hooked or bulbous hair roots plucked from under the skin should be clearly visible.



3. If the samples are contaminated with faeces, trim the distal end beyond the knot (opposite end to the bulbs). Place the knotted hairs in an envelope, which should be labelled with the unique identity of the subject from which the sample was collected. It is this identity that will appear on the report.



4. Overseas submissions only

Samples originating from countries other than Australia must be heat-treated at 70°C for 15 mins prior to dispatch. Overseas submissions must include a copy of the current Australian Quarantine Inspection Service (AQIS) permit and a declaration by a veterinarian indicating the samples were heat-treated as required. This documentation must be available on the outside of the package for Customs officials to check.

5. Samples and the accompanying paperwork are then dispatched via Post or courier to:

(Courier and overseas)

**Genetics Laboratory
Woodbridge Road, Menangle NSW 2568**

(Postal)

EMAI, PMB 8, Camden. NSW. 2570.

- *The submitter is usually invoiced on completion of the report, but payment will be accepted with the samples if preferred.*
- *All samples are retained if required for parentage verification at a later date.*
- *Further enquiries: Brendon O'Rourke, RVL Genetics. phone: 61 2 46 406 343
fax: 61 2 46 406 300
email: brendon.o'rourke@agric.nsw.gov.au*