



**HEREFORDS**  
Australia

## **Herefords Australia – DNA Procedure Policy**

### **1.0 DNA Processing Procedure:**

- 1.1 Herefords Australia Limited has the discretion to only accept DNA samples and results that have been submitted to the Herefords Australia office for testing.
- 1.2 Genetic samples and the correct paperwork are received at the Herefords Australia office from the submitting member and date stamped upon arrival.
- 1.3 DNA samples are processed, daily, with the test requests being loaded against the animals in the Herefords Database. (Each member will have their own dedicated batch for their DNA samples only, with a specific batch number, e.g.: 1712084)
- 1.4 Batches are submitted to the lab electronically, generating a DNA acknowledgement letter that is emailed to the submitting member. The acknowledgement letter will outline which test or tests have been requested.
- 1.5 The samples and appropriate paperwork are then bundled and sent to Neogen Australasia. (Processing time will vary dependent on what tests are being requested – from 10 days to 8 weeks. The processing time starts from when the lab receives the samples.)
- 1.6 Once the testing is complete, Results are then emailed to Herefords Australia and ABRI. AGBU also receive a copy of genotypes for construction of the Gene Matrix (G-Matrix). Each batch file is then manually loaded into the database. These genotypes are used in the Single Step process.
- 1.7 Herefords Australia then generate an email report that is sent directly to the submitting member via the email address stored on the HA database.
- 1.8 Parent verification is usually the last set of results to come in for a batch.

### **2.0 Order of Receiving Test Results:**

- 2.1 GGP Data (LD & HD)  
(LD testing takes approximately 4-6 weeks. HD testing is 6-8 weeks approx.)
- 2.2 Genetic Condition Results
- 2.3 Parent Verification

### **3.0 Parent Verification Result Process:**

- 3.1 Parent verifications are always requested where possible. Parent verifications are not possible when a parent and the calf are on different DNA testing platforms (MiP vs SNP) or if the parent has not been DNA tested.
- 3.2 Parent Verifications are returned from Neogen Australasia, identifying if an animal has been qualified or excluded as a parent.
- 3.3 Parent Verification results are automatically updated on the Herefords Database. E.g. removal of an excluded sire etc.

### **4.0 Herefords Australia G-Matrix Parent Verification:**

- 4.1 Genotypes from the DNA testing process are included into the Herefords Australia G-Matrix database. These are all compared to each other, and genetic linkages are established. E.g. how closely an animal is related to another.



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- 4.2 As a result of the G-Matrix, incorrect parentages are identified.
- 4.3 Herefords Australia receive a monthly report of any animal in the G-Matrix with an incorrect parent (sire or dam).
- 4.4 If a parent/sire verification result which is returned from the monthly G-matrix report, supplied by AGBU/ABRI, conflicts with the current sire/dam recorded for that animal, Herefords Australia (the company) then re-test the PV result with a company approved lab (refer to *9.0 Company Approved DNA Laboratories*).
- 4.5 If the second PV confirms the result from the G-Matrix report (usually 10 working days), then the **owner of the sample** is contacted by Herefords Australia staff, an email confirmation provided, and advised that a discrepancy exists between the recorded pedigree of the animal and the genetic pedigree of the animal. The following regulation will be enforced:

**6.(xi) (a)** *In cases where the genomic data indicates a required amendment to an animal's record, the owner and breeder of the animal will be provided with 14 days' notice of the intended amendment, during which time evidence can be provided to controvert the intended amendment.*

- 4.6 The owner of the sample can accept the proposed pedigree change and Herefords Australia will change the pedigree of the animal.
- 4.7 If the owner of the sample does not accept the proposed pedigree change or if there is no alternate parent identified, then further testing is required before changing the pedigree of the animal.

**5.0 Procedure for further testing of an animal if the proposed pedigree change is not accepted:**

- 5.1 A second DNA sample from the animal must be supplied. For live animals, this can be hair or tissue. For deceased animals, this can be another straw of semen. This sample will be verified against the parent in question.
- 5.2 If the proposed parent is confirmed by further testing, then the animal's pedigree will be amended to reflect the genetic pedigree.

**6.0 Procedure for further testing if Parent is not identified:**

- 6.1 If the animal is no longer alive and stored DNA (i.e. semen) has been used, then a secondary batch of stored DNA (i.e. different batch of semen) must be tested to confirm or exclude the sire and or dam.
- 6.2 If the animal is no longer alive, and the owner of the animals and or the DNA (i.e. semen or tissue) is unable to provide further samples for testing (incl different batch of semen) then Herefords Australia has the power to test DNA material including semen provided by the owner of that material to confirm whether the animal is verified or not.
- 6.3 If further testing fails to identify an alternate parent, or if no further testing was possible, then the following regulations are enforced:

**6.(xi) (b)** *Where genomic data suggests unresolved discrepancies in the recorded sire, dam, sex or genetic condition status of an animal born prior to 1 January 2018 the recorded information and the animal's registration status will remain unchanged;*



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**6.(xi) (c)** *Where genomic data suggests unresolved discrepancies in the recorded sire, dam, sex or genetic condition status of an animal born after 1 January 2018 the suspected incorrect information will be removed from the database and the animal's registration status will be revoked until the discrepancies are resolved.*

#### **7.0 Parent Verification Status of Animals:**

The following verifications will be applied to an animal's details to identify what level of DNA verification has occurred:

- 7.1 **Verified** – The sire/dam has been DNA Verified as correct (If a sire or dam is NOT excluded from the G-Matrix then for registration purposes Herefords Australia will consider that sire or dam to be correct unless any further testing proves otherwise).
- 7.2 **Not Verified** - The animal is not DNA verified to its pedigreed parent and re-testing has commenced as per the HAL DNA Policy.
- 7.3 **Not Verifiable** - If the animal is born prior to 1 January 2018 and has been DNA tested however the listed sire/dam is not DNA verified and no further re-collection and testing of DNA samples is possible in accordance to the Company's DNA Testing Policy.
- 7.4 **Failed** - The animal has failed DNA verification to the sire/dam after re-testing in accordance to the Company's DNA Policy.
- 7.5 **Not tested** - The animal has not been verified to sire or dam using DNA Verification

#### **8.0 Hierarchy of Parent Verification:**

Herefords Australia acknowledge that there is a hierarchy of accuracy for parent/sire verification as follows:

1. High Density (150,000 SNP)
2. Low Density (50,000 SNP)
3. SireSeek (500 SNP)
4. SEQ1 (100 SNP)
5. MiP (21 MiP markers)
6. Provided Pedigree

As a result, there are very limited times when pedigrees as confirmed by lower status tests could vary to tests from higher accuracy. Herefords Australia will always use the highest accuracy test available.

#### **9.0 Company Approved DNA Laboratories:**

As per the Herefords Australia Regulations, the Company reserves the right to only accept DNA/Genetic/Genomic test results from company approved laboratories. The following laboratories are currently approved by Herefords Australia:

- 9.1 Neogen Australasia Pty Ltd, Gatton, Queensland.

For all DNA testing, the owner of the sample is responsible to abide by the current Regulations of the company, especially **Section 6 – DNA Testing**.