



WEATHERBYS SCIENTIFIC WELCOME GUIDE



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Thankyou for choosing Weatherbys Scientific

Thank you for choosing Weatherbys Scientific to conduct your livestock genotyping.

Here is some information to help you understand *What is genotyping* and to walk you through the process from the collection of samples to the final reporting of your results and everything inbetween.

Family owned, world-renowned

Weatherbys Scientific - the market leader in providing animal genetic testing solutions to the Australian and New Zealand livestock industry.

What is genomic testing?

Genomic testing or genotyping is the process of analysing an animal's DNA to understand their genetic merit, identify potential health risks and reliably predict future performance in the herd through further breeding value analysis. When we perform genotyping, we are reading the DNA sequence and turning the physical sample from your animal into a digital DNA map of sorts. This map is commonly referred to as a genotype and is made up of a combination of SNPs (pronounced 'snips') or single nucleotide polymorphisms. The order and placement of these SNPs help us to identify genetic differences between your cattle, read specific DNA locations to recognise traits and genetic conditions and identify parentage information. All of this in combination will be added into the system that works to provide you with GEBVs or Genomically Enhanced Breeding Values.

At Weatherbys, we accept 3 types of DNA samples:

- Hair
- Tissue
- Semen

Key Benefits of Genomic Testing

Genomics allows breeders to make informed decisions to:

- Avoid the incidence of fatal diseases
- Reduce or eradicate unwanted traits
- Increase the occurrence of valuable traits within your herd

In traditional scenarios, animals that are genetic carriers of fatal diseases and unwanted traits are only discovered when two carriers are bred and produce an affected calf. With genomics however, you can gain a clear picture of your herds genetics and manage your breeding program to avoid their incidence. It grants you the opportunity to manage quality animals that may be carriers, without the need to cull them.

Effective use of genomics within a breeding program also allows breeders to make selection decisions at an earlier age, decreasing the need to grow out animals before they are culled and increase the genetic gain made with each generation.

SNP Chips Explained

Genomic testing is performed using a SNP chip. The density of these chips varies between the animal species being tested and the laboratories performing the analysis. Different SNP densities used in the market today include 35K, 50K and 100K and it means that the genotype produced includes 35,000, 50,000 or 100,000 points of data (SNPs).

There are about 4 million SNPs in a Bovine genome, which cover off every single biological detail in an animal. 98% of these SNPs will be the same for every cow in the world: 2 ears, 4 legs, 1 tail etc. Variations in the genome are things like coat colour, horns or polled, dairy cow, Shorthorn or Hereford appearance.

So when it comes to developing and utilising a SNP chip, the density makes little difference to the accuracy of final results, it is the selection of SNPs featured on the chip which has the greatest impact as it determines what traits and health conditions can be read.

BREEDPLAN for example, requires a minimum of 6,000 SNPs to generate Estimated Breeding Values. Breeds utilising Single Step Analysis such as Angus, Hereford, Brahman and Wagyu accept both 50K and 100K genotypes.

At Weatherbys we have developed and use a 50K SNP chip, this includes the following SNPs:

- 11,500 Bos Indicus Specific
- 11,000 are highly informative for Composite Cattle 3,000 for Dairy
- The remaining covers Indicus, Composite & Bos Taurus Traits



Weatherbys Genotyping Process

01.

Sample collection

- We accept Tissue Sampling Units (TSUs), Tail Hairs and Semen Samples.

02.

Sample submission

- Place your order by emailing your **account set up form** and **sample submission form** to: **hello@weatherbys.com.au**
- Please note in your submission form where you would like your data reported to and the format required.
- Please note - Weatherbys Scientific are agonstic and will work with any third party Evaluation Centre of your choosing.

03.

Submit Samples

- Post samples to: PO BOX 6493, Clifford Gardens, QLD 4350.
- Please list your name and contact number on the parcel

04.

Genotyping and analysis

- When your samples are received, our lab will perform quality checks, genotyping and subsequent data analysis.
- You will receive a sample receipt notification from our Customer Service Team (cs@weatherbys.com.au) and they will also notify you of any sample issues.

05.

Result Delivery

- Weatherbys Scientific will directly upload your data to our online SharePoint portal as well as your designated Evaluation Centre. Breeding values will be provided to you by your chosen Evaluation Centre.

06.

Invoicing

- Weatherbys will email your invoice for payment.

05.

DNA SAMPLE COLLECTION – TISSUE SAMPLE UNITS

- Tissue Sampling Units (TSUs) are a quick and efficient method of DNA sample collection
- Using minimal constraint, a single-squeeze motion uses TSUs to take an ear punch tissue sample into the vial specially designed to prevent contamination of genetic material. The vial seals the tissue sample with preservative to give high quantity and quality DNA, ensuring the best outcome in the lab.
- TSUs can be purchased directly from Weatherbys Scientific

[Allflex Tissue Sampling Unit \(TSU\) Tutorial with Sheep](#)

Best practice tips for Tissue sampling:

- Ensure that the animals ears are free from contamination
- TSUs are clean
- Avoid sanitisers, soaps or disinfectants near the sampling site before taking the TSU as this will degrade the DNA in the sample
- Check that there is minimal blood in the sample and other contamination is avoided where possible
- Make sure the red stopper is all the way in the sampling unit and has sealed to prevent liquid leaks and oxygen getting into the sample

Post sampling care and transport instructions

- Store samples at or below room temperature, in a cool, dry, dark place.
- Avoid extreme temperatures including hot cars and freezers
- Send TSUs in a padded envelope or box to prevent damage during transport.

DNA SAMPLE COLLECTION FROM TAIL HAIR

DNA tests can be carried out using cells from the roots of a hair sample. Hairs should be taken from the switch of the tail.

How to correctly collect a hair sample

01.

Tail Hair Collection Kit

- Collection kits can be purchased through Weatherbys, they include a hair collection card (providing space to list the Animal's ID & Sex), zip lock bag and sticker to attach the hair to the card.

02.

How to correctly take a hair sample

- Try to get 40 - 50 hair follicles from the switch of the tail
- To remove the hair, pull upwards against the grain of the tail in a single motion
- Check you have good follicles by holding the hairs up against a background.
- Fill in the animal details and attach the hair to the card using the sticker provided
- Cut the excess hair off using scissors, so no hair overhangs the card
- Ensure sample is dry and free of dust, muck or contamination.

03.

Sample storage

- Once you have taken the sample, ideally keep it dry, cool and if possible, in a dark place.
- Hot conditions and direct sunlight can degrade the DNA - DO NOT leave them on the dashboard of your vehicle.

04.

Postage

- Mail samples to: PO BOX 6493, Clifford Gardens, QLD 4350.





SHIPPING OF SEMEN SAMPLES

- **Please submit whole semen straws for testing - Weatherbys will only accept unused straws**
- We recommend allowing the straw to thaw in the fridge after removing it from liquid nitrogen
- To prevent breakage during transit we recommend placing the straws in empty pen barrels with an ice brick or two. The semen does not need to arrive to us frozen but the ice helps reduce their exposure to high temperatures that could degrade the DNA in the sample



SAMPLE SUBMISSION FORM

You can find our Ovine sample submission form [here](#) and Bovine sample submission form [here](#)

Please add the following details to the **Sample Submission Tab**:

- **Account name** eg. Weatherbys Pastoral
- **Owner Name**
- **Species** (e.g. Bovine / Ovine / Equine)
- **Breed** (eg. Angus, White Suffolk)
- **Sample type** (eg. TSU, Hair or Semen)
- **Test Required:** Please select which **test** you require for your animal from the **TEST DESCRIPTION LIST**
- **Trait Request:** Please select which **trait** you require for your animal from the **TRAIT DESCRIPTION LIST**
- The number you add to the **Reporting Tag ID** is generally the management number for the animal (depending on the breed society).
- **Sample (TSU/Hair Card ID):** is the number shown on the actual TSU or the Hair Card.
- Finally, please provide the **Sex** and **Birth Year** of the animal.

*For **Ovine genotyping**, please provide us with a list of potential sires and dams.

For **Bovine genotyping**, on the tab named **REQUIRED Sample Batch Details** please provide the details shown (collection dates, prepared by, postage method and sample tracking, any special requirements and traits to be reported, and any genomic reporting requirements, eg. Breedplan, UQ GBVs etc).

Finally, please provide us with your Billing Details and any Customer PO/ Reference no.

PLEASE RETURN YOUR SAMPLE SUBMISSION FORM TO YOUR WEATHERBYS SCIENTIFIC AUSTRALIA REPRESENTATIVE IN "CONTACT US".

WEATHERBYS SCIENTIFIC REPORTS

A link to our file sharing folder in **SharePoint** will be supplied when you open an account with Weatherbys. Your **Final Results** will be uploaded here and your nominated email address will be notified when results are available.

Results are shared via an excel spreadsheet showing the following data:

- DNA Case ID - **Referred to as your G Number****
- Animal Identification: Identification number provided in the *Reporting Tag ID* column of your submission form.
- Test Type
- Test Result - For Interpretation refer to Page 9.
- Sire_Case_Q: Refers to the Sires G number.
- Sire_Ident_Q: Refers to the Sires ID in Weatherbys database.
- Dam_Case_Q: Refers to the Dams G number.
- Dam_Ident_Q: Refers to the Dams ID in Weatherbys database.
- Sires_excluded and Dams_excluded: When conducting parent allocation, providing us with a list of expected sires and dams; any sires or dams listed that don't verify to an animal are then shown here in the excluded columns. They have been excluded as potential parents.
- Birth date
- Sex

****Please provide us with the G number shown in your report for any future enquiries**

RESULTS INTERPRETATION

Definitions:

Homozygous - An animal has two identical versions of the same gene (one inherited from the sire and one inherited from the dam)

Heterozygous - An animal has two different versions of the same gene (one inherited from the sire and one inherited from the dam)

Carrier - An animal carries a gene associated with a disease, trait or other genetic condition

Affected - An animal is affected with the disease, trait or genetic condition

Myostatin:

0 = Zero copies of the Myostatin gene present

- (does not carry and is not affected by Myostatin)

1 = One copy of Myostatin gene present

- (carrier of Myostatin gene – animal is unaffected but can pass the gene onto progeny)

2 = Two copies of Myostatin gene present

- (Likely affected by Myostatin and can pass the gene on to progeny)

Weatherbys Scientific tests for **9 Myostatin variants**. An individual result is provided for each variant so you can identify which one, if any is affecting your animal. These variants include: **C313Y, D182N, E226X, E291X, F94L, NT419, NT821, Q204X, and S105C**.

RESULTS INTERPRETATION

Definitions:

Polled Categories:

Pc = Polledness of Celtic Origin

Pf = Polledness of Friesian Origin

H = Horn

Polled Genotypes (Autosomal dominant):

PcPc, PfPf and PcPf = Homozygous Polled – Visually predominantly Polled (intermittent Scurs)

HPc and HPf = Heterozygous Polled – Visually Polled or Scurred

HH = Horned – Visually Horned

Coat Colour:

ED = Homozygous Dominant Black

ED/e = Dominant Black/Recessive Red

ED/ E+ = Dominant Black/Wildtype

E+/e = Wildtype/Recessive Red

E+/ E+ = Homozygous Wildtype

e/e = Homozygous Recessive Red

Single Trait Results:

N = Homozygous Non Carrier

C = Carrier

A = Homozygous Affected

CONTACT US

www.weatherbyscientific.com.au

hello@weatherbys.com.au



Tamarah Luxton

Territory Manager, AU / NZ

tluxton@weatherbys.com.au+61

(0) 474 633 799



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