Getting started with genomics in commercial heifer selection

Producer case study: Geoff Hayes, Glen Innes, NSW

Background

Selecting replacement heifers is one of the most important decisions made by commercial beef producers each year. Every heifer retained has the potential to influence herd productivity and profitability for many years to come, making it critical to identify females with the greatest potential.

Through the MLA-funded Producer Demonstration Site (PDS) project 'Optimised Heifer Selection', commercial Angus producer Geoff Hayes and his partner Belinda Crosby are exploring how genomics can be combined with phenotypic data to make more informed replacement heifer selection decisions.

Geoff and Belinda operate a commercial Angus breeding herd at their 550ha farm, Inglevale, located south of Glen Innes in NSW.

Involvement in the project

Geoff and Belinda have been using genomic testing for their bulls since 2022 and see genomics as an important tool for reducing risk when making breeding decisions.

While visual assessment remains an important part of selecting replacement females, they wanted to understand how genomic information could be used alongside on-farm performance data to identify the heifers most likely to become productive breeders.



Image 1: Inglevale heifers in the paddock after weaning

"Every replacement heifer represents a long-term investment in the herd," Geoff said. "The challenge is knowing which animals will perform over their lifetime, not just which ones look good at a particular point in time."

When Geoff and Belinda learned about the PDS project, they jumped at the opportunity to evaluate how genomic information aligns with phenotypic data and whether combining the two can improve confidence in replacement heifer selection decisions within their commercial herd over the five-year project.

A deep dive into on-farm practice

Geoff and Belinda's breeding objective is to breed a resilient, fertile herd capable of performing under seasonal variability while improving reproductive efficiency. Structural correctness, longevity and durability with both bulls and females remain high priorities within their breeding program.

Several management practices at Inglevale support the development and selection of productive replacement females to support this breeding objective.

Reproduction: To spread seasonal and market risk, Inglevale operates both spring- and autumn-calving herds. Artificial insemination (AI) is predominantly used, particularly for the heifers when seasonal conditions permit, achieving approximately 68% conception rates with fixed-time AI and around 84% overall pregnancy rates following one cycle with backup bulls.

Bull management: Yearling bulls, at 14 months of age, are used to back up the females at a ratio of 1 bull to 20 females.

Health and weaning: Calves are yard-weaned at 5–6 months of age and managed under a comprehensive animal health program. Geoff credits the introduction of respiratory vaccines with improving the consistency of his weaner performance and reducing the number of underperforming calves.

Together, these practices provide a strong foundation for evaluating the performance of replacement heifers and the impact of genomics within the breeding program.

Integrating genomic selection tools and on-farm phenotypic assessments

Genomic testing

At the commencement of the PDS project, Geoff and Belinda genomically tested their first cohort of 53 replacement heifers using Tissue Sampling Units (TSUs) collected at weaning. The heifers needed to be a minimum weight of 240kg to be retained and genomically tested. The TSU samples were collected and submitted for genomic analysis using the Neogen Igenity genomic testing tool to get information on each heifer's genetic potential across a range of economically important traits.

To best align with the Inglevale breeding objective, the Igenity Maternal Index (IMI) was selected to assess the heifers' genetic potential.

The index focuses on identifying replacement heifers with greater potential for fertility, longevity and higher weaning weights.

When the genomic testing results were received, which took several weeks, the heifers were then ranked using the IMI index from highest to lowest. Then they were sorted into the top 20%, middle and bottom 20%. The results from the genomic testing of the heifers are summarised below.

Table 1: Igenity Maternal Index (IMI) heifer results for Inglevale

IMI ranking	Number of heifers	IMI range	Average IMI
Top 20%	10	6.05 - 6.75	6.34
Middle	33	5.20 - 6.00	5.70
Bottom 20%	10	4.60 - 5.15	4.88
Total	**53**	**4.60 - 6.75**	**5.67**

The genomic information collected on these heifers will be compared to their lifetime phenotypic data. This will allow Geoff and Belinda to assess the ability of genomic information to inform heifer selection decisions in future cohorts.

Phenotypic data collection

To gain a complete picture of each heifer, phenotypic data was also collected at several key stages:

1. **Weaning:** At weaning, the heifers were assessed and measured to establish baseline performance data. Condition and Docility scores were collected following the Angus Australia Paddock Guides. The data collected included:
    - weaning weight
    - condition score (0 - 5, see guide)
    - docility score (1-5, see guide)
    - management group information.

    A summary of the weaning results is presented in the table below.

For further information: Georgia Pugh, neXtgen Agri. **M** +61 408 947 488 **E** georgia@nextgenagri.com

Any recommendations, suggestions or opinions contained in this publication do not necessarily represent the policy or views of Meat & Livestock Australia (MLA). No person should act on the basis of the contents of this publication without first obtaining specific, independent professional advice. MLA takes no responsibility, in any way whatsoever, to any person in respect to the document, including any errors or omissions therein, arising through negligence or otherwise however caused. © Meat & Livestock Australia 2026. ABN 39 081 678 364 This work is copyright. Apart from any use permitted under the Copyright Act 1968, all rights are expressly reserved. Requests for further authorisation should be directed to the Corporate Communications Manager, PO Box 1961, North Sydney, NSW 2059 or info@mla.com.au.

Table 2: Weaning results summary

Weaning results	Liveweight (Kg)	Condition score (CS)	Docility score
Minimum	224	2.5	1
Maximum	342	3.5	2
Average	**265**	**3**	**1.5**

2. **Yearling assessments:** Additional phenotypic measurements were collected on the heifers at 12–14 months of age. Yearling data collected included:
    - liveweight (Lwt)
    - condition score (CS) (0 - 5, see guide)
    - structural assessment scores following the Angus Australia Paddock Guide to Structural Scoring:
        i. Front claw set
        ii. Rear claw set
        iii. Front feet angle
        iv. Rear feet angle
        v. Rear leg side view
        vi. Rear Leg Behind.

    The following table summarises the data collected on the heifers as yearlings.

Table 3: Yearling results summary

Yearling results	Lwt (Kg)	CS	Claw set		Feet angle		Rear leg	
			Front	Rear	Front	Rear	Side	Behind
Min	251	2	5	5	2	3	2	3
Max	392	6	7	7	6	6	6	7
Average	**288**	**2.9**	**5.5**	**5.6**	**5.2**	**5.3**	**4.7**	**5.7**

Final heifer selection and additional data to be collected before joining

Before joining, which will take place in October 2026, Geoff and Belinda will do the final selection of heifers using a combination of the genomic results and phenotypic data.

They have several key selection requirements for the heifers for joining, including:

- not being in the bottom 20% for the IMI genomic tool ranking
- minimum liveweight of 350kg
- structural soundness
- docility
- minimum condition score of 3.

All heifers have met the requirements for structural soundness and docility to be joined. However, due to it being a particularly tight season at Glen Innes during 2026, the heifers commenced a supplementary feeding program in July to get them up to the minimum weights and condition scores required for joining. The ration fed out began at 90% corn silage and 10% canola meal, fed at 3% of body weight. After one month on this ration, 10% barley was added to the ration; corn dropped to 80%, and canola meal remained at 10%. The heifers have been achieving an average daily gain of 1.2kg/day, with their growth and weight gain monitored using in-paddock Optiweigh technology.

Geoff and Belinda plan to join all heifers that meet the above criteria. Any heifers that don't get up to weight or body condition will be carried over for joining in Autumn.

What's ahead: measuring the impact

As the project progresses, pregnancy scanning and calving data will be used to assess the reproductive performance of the heifers. This will allow Geoff and Belinda to assess how genomic information, alongside on-farm phenotypic assessments, contributes to heifer selection outcomes on their property.

Three cohorts of heifers will be followed through multiple breeding cycles, tracking conception timing, calving ease, calf survival, rebreeding rates and long-term retention.

To learn more and follow the project's progress, visit the Heifer Selection Hub page.

For further information: Georgia Pugh, neXtgen Agri. **M** +61 408 947 488 **E** georgia@nextgenagri.com

Any recommendations, suggestions or opinions contained in this publication do not necessarily represent the policy or views of Meat & Livestock Australia (MLA). No person should act on the basis of the contents of this publication without first obtaining specific, independent professional advice. MLA takes no responsibility, in any way whatsoever, to any person in respect to the document, including any errors or omissions therein, arising through negligence or otherwise however caused. © Meat & Livestock Australia 2026. ABN 39 081 678 364 This work is copyright. Apart from any use permitted under the Copyright Act 1968, all rights are expressly reserved. Requests for further authorisation should be directed to the Corporate Communications Manager, PO Box 1961, North Sydney, NSW 2059 or info@mla.com.au.