Informing New Zealand Beef

October 2020

Background

The New Zealand (NZ) beef industry consists of approximately 25,000 farmers with 3.6 million beef cattle. Of these, 1 million are breeding cows which combine with the dairy herd to produce 1.4 million animals for processing each year. Beef exports total $4.2 billion and support many of the 92,000 people employed directly as a result of the sheep and beef industry.

The world is increasingly demanding high-quality food with a lower environmental footprint, and NZ's beef industry is responding to this. With the right science and data systems to support it, the beef industry can produce meat with a great environmental story combined with exceptional eating quality while still maintaining and improving our production efficiency. Our meat companies are already moving in this direction, with several introducing meat quality focussed beef grading systems, and working together under the Taste Pure Nature initiative to target the "conscious foodie" consumer.

Beef + Lamb New Zealand Genetics is undertaking a programme of work on behalf of the New Zealand Beef industry to give farmers the tools to achieve this. New Zealand producers will have the opportunity to develop NZ-based data systems which collect data from both stud and commercial herds, giving farmers the opportunity to select the genetics that are right for their environment. This data will include carcase and reproductive information, accommodate new traits with an environmental focus and provide important linkage to the dairy beef industry. Kiwi farmers are not in a bubble and this programme will continue to collaborate with international systems.

The programme will build on other successful initiatives Beef + Lamb New Zealand Genetics has delivered and involves seven areas of work. These start with developing NZ-centric breeding objectives focussed on our pasture-based system, where cows play a dual role supporting sheep production while still producing a highly valuable product. This will be followed by collecting the data necessary to assess the traits that make up that index and delivering that information back to farmers. Lastly, and most importantly, the programme will bring a laser-like focus to the challenge of industry uptake and knowledge transfer to the commercial farmer community.

Modelling suggests that if we get this right, farmers can improve the beef industry's income by $460million while also improving the environmental and social outcomes for their farms and communities.

The NZ beef industry is on a mission:

To build an industry utilising best practice genetic tools and extension systems to maximise the rate of productive gain supporting a profitable, sustainable and consumer conscious industry.

A focused set of 7 projects to deliver the benefits.

1

Trait and National Breeding Objective (NBO) assessment

Utilising industry value chain input assess the genetic traits (existing and novel) and NBO's that underpin the value chain performance. This will ensure fitness for purpose of new traits/NBO's by extending the current sheep genetics process to beef cattle.

2

Data measurement and collection

Using traits from above, develop measurement and collection systems as required to collect phenotypic and genotypic data.

3

Beef Progeny Test

Using three breeds (Angus, Hereford, Simmental), undertake a cross breed progeny test to identify performance for the traits agreed above linking with international beef and dairy beef genetics.

4

Next Gen commercial genomics

Using commercial genomic tools, support the majority of industry stud breeders to use genomic tools to support stud operations and improve BV/NBO calculations.

Using commercial genomic tools, identify a range of commercial farmers who are able to record key traits in a commercial environment to provide broader based performance data to support genomic selection tools.

5

Genetic engine development

Develop a genetic engine based on sheep genetics experience to combine phenotypic, genotypic and genomic data to calculate breeding value for agreed traits for potential inclusion in nProve system.

6

Data management and decision support tools

Extend nProve genetics systems to manage data for use in the genetic engine and report breeding values and indices calculated for use by the stud cattle and commercial users utilising international best practice single step methodology.

Ensure on-farm data is owned by supplying farmers, progeny test data and BV's are owned by the industry, and support development of proprietary data if commercially funded.
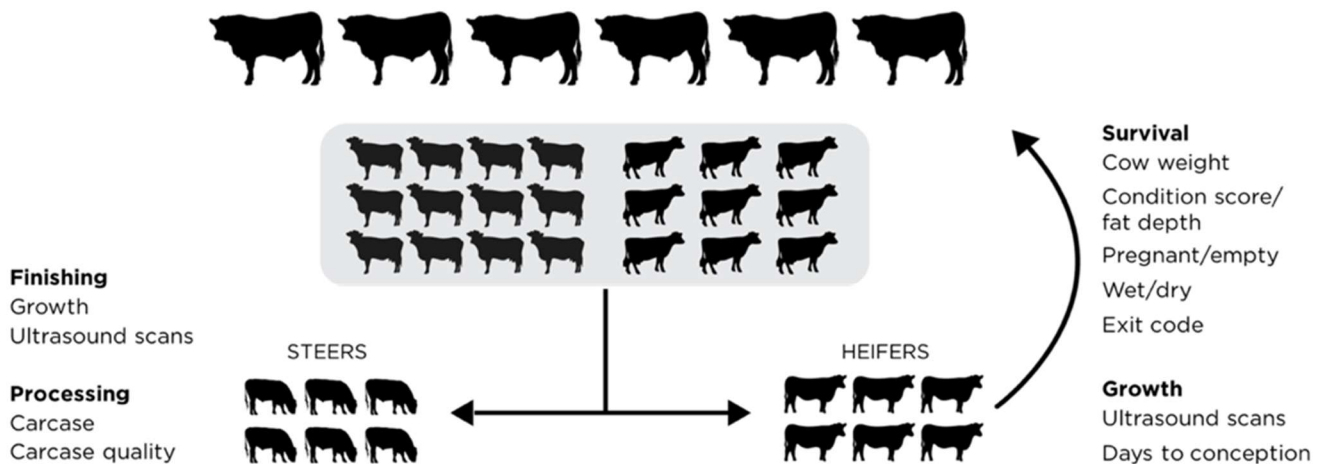
7

Industry uptake

Use human centred design methodology to improve understanding of genetics uptake in the industry. Revise current extension tools and develop new ones as required.

Focus on using better bulls and AI in the commercial herds.

Employ dedicated beef focused resources.

Beef Progeny Test

Beef Progeny Test: evaluating finishing and/or maternal performance

Finishing
Growth
Ultrasound scans

Processing
Carcase
Carcase quality

STEERS

HEIFERS

Survival
Cow weight
Condition score/
fat depth
Pregnant/empty
Wet/dry
Exit code

Growth
Ultrasound scans
Days to conception

The new Beef Progeny Test has several different roles and goals, with a different emphasis from the previous test:

- Provide the essential data required to support a multi-breed analysis.
- Develop estimates of hybrid vigour in different traits under NZ environment – with the primary purpose of improving accuracy of multi-breed analysis, and a side benefit of demonstrating the value of cross-breeding in commercial cattle production.
- Create genetic linkage to other datasets – international sires and other beef progeny tests
- Provide the nucleus for any New Zealand beef evaluation

In year one, with time very tight between funding being confirmed and mating, a farm has been secured to get the progeny test underway. This year, the INZB team will secure bulls to create linkage to international datasets, the dairy-beef progeny test and the previous beef progeny test

Over time at that farm, we will eventually run three breeds of cattle – Hereford, Angus and their crosses (HxA, AxH). We know that heterosis has a bigger effect in maternal traits, so the crosses will be retained to breed allowing us to measure the performance of their offspring. All calves will be castrated and carried to finishing on that farm if possible. The usual group of traits will be measured in the first instance (reproduction, growth and carcase) however other traits may be added depending on the outcome of Project 1 – Trait and National Breeding Objective assessment. Other breeds will be assessed on other farms in later years, using the linkage created on this farm.

Note: the farms that were part of the previous Beef Progeny Test will not play a central role in this progeny test. B+LNZ Genetics will continue to collect data from the animals already bred to build a more complete data set including maternal cow performance and linking to the new progeny test animals.

Conclusion

The NZ beef industry is on a mission:

To build an industry utilising best practice genetic tools and extension systems to maximise the rate of productive gain supporting a profitable, sustainable and consumer conscious industry.

Combining industry experience, expertise and investment with farmer support will get the industry over the line, not only lifting returns, but positioning it strongly for the future.