PBB business solutions

IGENITY® BEEF HANDBOOK

The Path of Confidence

NEOGEN® | Igenity®

WELCOME TO IGENITY

Since its introduction in America in 2003, the revolutionary Igenity® DNA testing portfolio has powered confident decisions in cow-calf production. We are excited to offer this innovate tool to commercial beef breeders all over New Zealand.

Igenity profiles provide a tool to rank cattle on traits that impact productivity, helping commercial producers select replacement heifers based on genetic merit. Igenity ranks cattle using simple 1–10 scores for key traits.

CONTENTS

GETTING STARTED

BEEF GENOMICS EMPOWERING YOUR FUTURE

Select, manage, and market cattle with more confidence. Evaluate maternal, performance, and carcass traits in one step. Focus time, feed, and resources on young breeding stock of verified merit.

- Invest in heifers that improve stayability and reproduction.
- Raise cows tailored to your production and grazing goals.
- Sort and compare cows to herd mates.

LEVERAGE CROSSBREEDING PLUS DNA SELECTION

Igenity® is designed for crossbred and straightbred cattle of eight key breeds; Angus, Red Angus, Hereford, Limousin, Shorthorn*, Simmental, Gelbvieh. This unique design helps you use heterosis plus DNA scores to make faster progress on your goals.

IGENITY® BEEF PROFILES

Get 17 maternal, performance, and carcass traits.

- Maternal: Birth weight, calving ease direct, calving ease maternal, stayability, heifer pregnancy, docility, and milk.
- Performance: Residual feed intake, average daily gain, weaning weight, scrotal circumference and yearling weight.
- Carcass: Tenderness, marbling, ribeye area, fat thickness, and hot carcass weight.

IGENITY BEEF RESULTS KEY

HOW TO INTERPRET YOUR IGENITY BEEF RESULTS

Igenity® profiles of replacement heifers helps you evaluate their genetic potential for maternal, performance, and carcass traits. This makes it easy to review and focus on those making the biggest impact.

Igenity reports on 17 traits to help you select, manage, and market your cattle. Using Igenity profiles can help you know more about the genetic potential of young breeding stock before you have made significant investments in their development.

MATERNAL TRAITS DRIVE PRODUCTION

MATERNAL

Birth weight, calving ease direct, calving ease maternal, stayability, heifer pregnancy, docility, and milk.

Calving difficulties, cows that don't breed back, heifers with poor conception, cattle with poor dispositions, and cows that milk too much, or not enough, all hurt your bottom line. Evaluating maternal traits in your breeding stock helps you develop a cow-herd that will be more productive for years to come.

PERFORMANCE TRAITS DRIVE EFFICIENCY

PERFORMANCE

Residual feed intake, average daily gain, weaning weight, and yearling weight.

Heifers and cows that don't require extra feed to maintain body condition are more efficient cows. By selecting females with lower RFI and higher ADG, you will improve efficiency of maintenance and gain in your herd. Selection pressure on these traits can help improve feed efficiency in future calf crops, too. For example, pens of feeder calves can be grouped with other animals of similar potential, and be fed or marketed based on that potential. This leads to more uniform and efficient gain in the finishing phase.

CARCASS TRAITS DRIVE VALUE

CARCASS

Tenderness, marbling, rib eye area, fat thickness, and hot carcass weight.

Predicting carcass merit is important whether you are raising feeder calves for sale at weaning, retaining calves to finish, and/or selling on quality grids. Igenity allows you to select breeding stock that produce high-quality carcasses among their progeny. Plus, sorting high-quality cattle from lower-potential cattle helps you manage and market each group more appropriately.

HOW TO USE YOUR SCORES

IGENITY GENETIC EFFECTS TABLE

MATERNAL TRAITS

Igenity Scores	Birth Weight	Calving Ease Direct	Calving Ease Maternal	Docility	Heifer Pregnancy Rate	Milk	Stayability
	(kg)	(%)	(%)	(%)	(%)	(kg)	(%)
10	4.1	17.8	16.1	16.8	12.3	19.4	53.6
9	3.6	15.8	14.3	15	10.9	17.3	47.6
8	3.2	13.9	12.5	13.1	9.5	15.1	41.7
7	2.7	11.9	10.7	11.2	8.2	12.9	35.7
6	2.3	9.9	9	9.4	6.8	10.8	29.8
5	1.8	7.9	7.2	7.5	5.4	8.6	23.8
4	1.4	5.9	5.4	5.6	4.1	6.5	17.9
3	0.9	4	3.6	3.7	2.7	4.3	11.9
2	0.5	2	1.8	1.9	1.4	2.2	6
1	0	0	0	0	0	0	0

IGENITY GENETIC EFFECTS TABLE

PERFORMANCE TRAITS

Igenity Scores	Average Daily Gain	Residual Feed Intake	Scrotal Circumference	Weaning Weight	Yearling Weight
	(kg)	(kg)	cm	(kg)	(kg)
10	0.12	0.31	1.59	23	39.5
9	0.11	0.28	1.41	20.4	35.1
8	0.09	0.24	1.23	17.9	30.7
7	0.08	0.21	1.06	15.3	26.3
6	0.07	0.17	0.88	12.8	21.9
5	0.05	0.14	0.71	10.2	17.5
4	0.04	0.1	0.53	7.7	13.2
3	0.03	0.07	0.35	5.1	8.8
2	0.01	0.03	0.18	2.6	4.4
1	0	0	0	0	0

IGENITY GENETIC EFFECTS TABLE

CARCASS TRAITS

Igenity Scores	Hot Carcass Weight	Fat Thickness	Ribeye Area	Tenderness	USDA Marbling Score
	(kg)	(mm)	(sq. cm)	(lbs. WBSF)	(marb. units)
10	46.5	6.45	10.9	-0.54	150
9	41.3	5.73	9.7	-0.45	133
8	36.2	5.01	8.5	-0.45	116
7	31	4.3	7.3	-0.36	100
6	25.8	3.58	6.1	-0.27	83
5	20.7	2.87	4.8	-0.27	67
4	15.5	2.15	3.6	-0.18	50
3	10.3	1.43	2.4	-0.09	33
2	5.2	0.72	1.2	-0.05	17
1	0	0	0	0	0

UNDERSTANDING 1–10 IGENITY SCORING

The Igenity genetic effects table allows you to cross reference the 1–10 Igenity® scores for traits with their corresponding Molecular Breeding Values (MBV) or expected effects. This MBV is the prediction of how future progeny of an animal are expected to perform compared to the progeny of other profiled animals. Higher scores are not necessarily better — they just mean the animal has more genetic potential for that trait.

COMPARING SCORES BETWEEN PROFILED ANIMALS

The examples below show you how to equate Igenity® scores to variations in MBV effects from the genetic table.

Stayability (STAY)	Igenity Score	Genetic Effect	Description
Animal A	8	41.7%	Daughters of Animal A have a 29.8% greater probability of staying in the herd until six years of age than daughters of Animal B.
Animal B	3	11.9%	
		29.8%	

Average Daily Gain (ADG)	Igenity Score	Genetic Effect	Description
Animal A	8	0.09 kg	Animal A is expected to produce progeny that will gain 0.06 kgs more per day than progeny of Animal B, and therefore weigh 9 kgs more after 150 days on feed.
Animal B	3	0.03 kg	
		0.06 kg per day	

Residual Feed Intake (RFI)	Igenity Score	Genetic Effect	Description
Animal A	8	0.24 kg	Progeny of Animal B are predicted to consume 0.17 kgs less feed per day than progeny of Animal A to achieve the same daily gain.
Animal B	3	0.07 kg	
		0.17 kg	

DEFINITIONS OF TRAITS REPORTED

MATERNAL TRAITS

BIRTH WEIGHT (BW) — Variation in birth weight a heifer will pass along to its offspring. A higher score indicates greater genetic potential for heavier birth weight.

CALVING EASE DIRECT (CED) — Percentage of unassisted births, indicating greater probability a calf will be born unassisted out of a first-calf heifer. Genetic factors such as birth weight and shape of the calf are included in CED. A higher value is greater calving ease.

CALVING EASE MATERNAL (CEM) — The probability a first-calf heifer will calve unassisted. CEM includes all genetic factors that impact a heifer's ability to calve unassisted, such as pelvic area and her genetic contribution to birth weight. A higher value is greater calving ease.

STAYABILITY (STAY) — The chance a heifer will remain in the herd as a productive cow until at least six years of age. A higher value is desired.

HEIFER PREGNANCY RATE (HPR) — A heifer's potential to conceive during breeding season, relative to other heifers. A higher value is desired.

DOCILITY (DOC) — The animal's genetic potential to be calm or have calm offspring. Higher scores indicate a higher probabiltiy of progeny with acceptable disposition.

MILK (M) — Expressed as kilograms of calf weaning weight affected by the milk production of a calf's dam. This is not a prediction of actual kilograms of milk produced.

PERFORMANCE TRAITS

RESIDUAL FEED INTAKE (RFI) — This is an indicator of feed efficiency. It is the difference in animals' daily consumption of feed to achieve the same level of daily gain. Lower RFI indicates greater feed efficiency.

AVERAGE DAILY GAIN (ADG) — Based on kilograms of gain per day. The Igenity score for ADG identifies an animal's genetic potential for post-weaning growth.

WEANING WEIGHT (WW) — Kilograms at age of 205 days.

YEARLING WEIGHT (YW) — Kilograms at age of 365 days.

SCROTAL CIRCUMFERENCE (SC) — Difference in scrotal size as an indication of fertility in replacement females. A higher score equates to higher scrotal size.

CARCASS TRAITS

TENDERNESS (TEND) — Animals' genetic potential for carcass tenderness as measured by the Warner-Bratzler Shear Force test. A higher score indicates greater tenderness.

USDA MARBLING (MARB) — Marbling score indicates the degree of marbling in the rib eye at the twelfth rib expressed in USDA marbling units.

RIBEYE AREA (REA) — Estimates muscling in a beef carcass and is measured in square centimetres of the ribeye muscle at the twelfth rib.

FAT THICKNESS (FAT) — Scored as depth of fat in centimetres over the ribeye muscle at the twelfth rib. Higher fat thickness scores equate to lower lean yield.

HOT CARCASS WEIGHT (HCW) — Hot carcass weight is the hot or unchilled weight of the carcass after slaughter and the removal of the head, hide, intestinal tract, and internal organs.

OTHER REPORTS

SAMPLE REJECTED (SR) — The quality of DNA testing starts with the quality of the sample. Common reasons for sample rejection are: lack of animal ID on the sample, improper or blank information on an order form, insufficient hair follicle samples, mold, dirt, foreign or fecal matter, evidence of tampering, or sending in decomposing animal tissue.

NO RESULT (NR) — Some samples appear normal but don't produce acceptable results due to contaminants that are undetectable to the eye. To test the animal, a new sample will need to be submitted.

RESULTS ARE NOT COMPLETE (X) — At times, NEOGEN® will send out partial results, such as providing BVD PI results before Igenity® profiling is completed. The traits scored as an X indicate the analysis for that test has not yet been completed.

PUTTING YOUR RESULTS TO WORK

HOW TO USE THE RESULTS

Using the reports can help in many ways. For example, you can use the scores to sort cattle and manage them for breeding or production, or the data can help you pinpoint strengths and weaknesses in your cow herd and identify traits you want to improve. Long term, you can use your Igenity® reports to track improvements across multiple traits, increase uniformity in your cattle, and measure your progress.

IGENITY MATERNAL INDEX

The Igenity Maternal index places emphasis on fertility, reproduction and weaning weight. This index is designed for producers wanting to keep their own replacement females and market calves at weaning.

- Improved stayability and cow maintenance trends.
- Modest increases in milk.
- Still favorable impacts on gain and carcass traits.

IGENITY PRODUCTION INDEX

The Igenity Production index balances maternal traits with gain and carcass characteristics, placing a large emphasis on stayability and marbling, with a negative emphasis on residual feed intake. This index is designed for producers wanting to keep their own replacement females while marketing calves at harvest on a grid.

- Significant increases in marbling and Average Daily Gain (ADG) due to larger emphasis.
- Igenity score for stayability increased almost a full point.
- Overall a positive increase in maternal, terminal, growth, and maintenance traits.

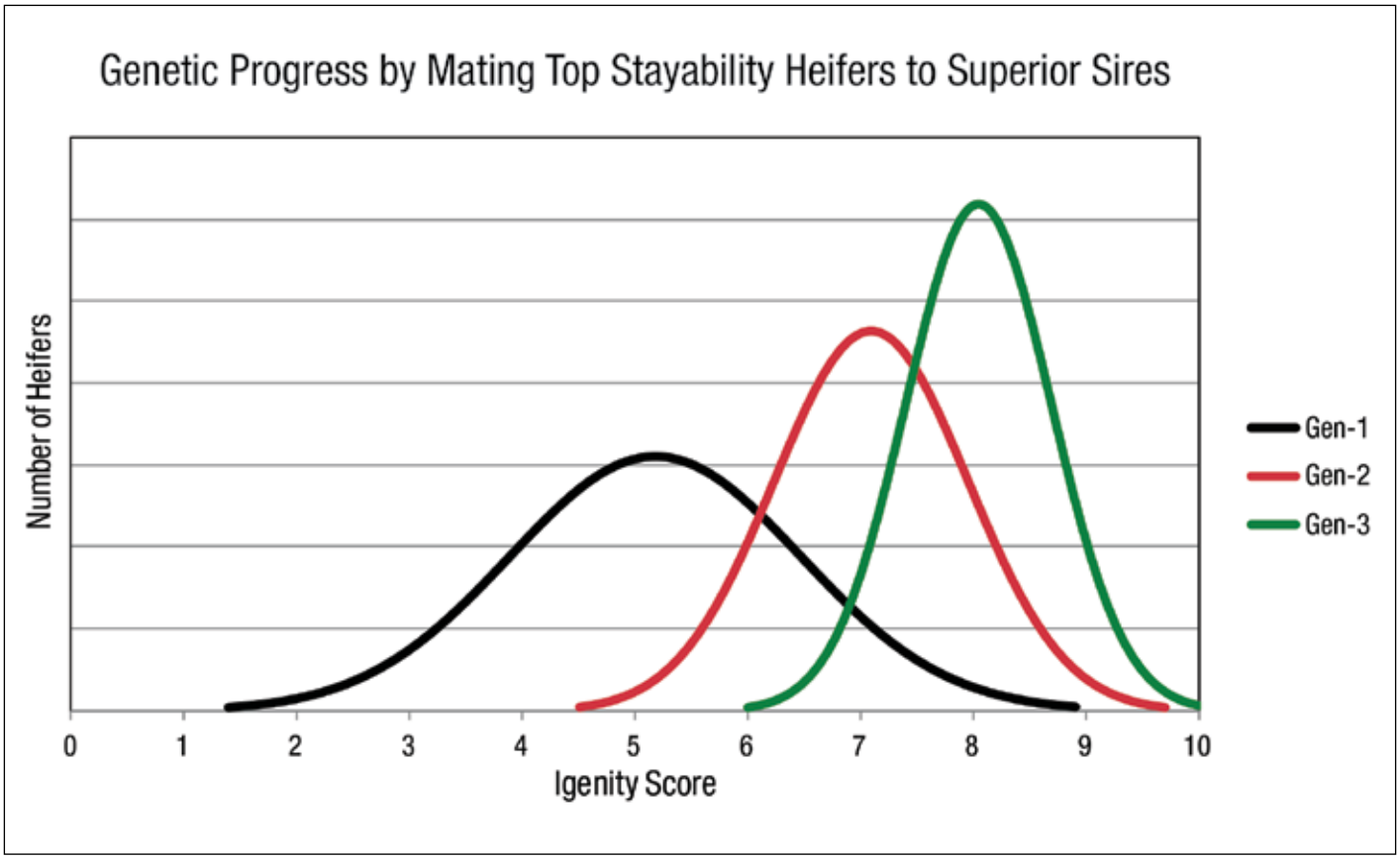
IGENITY TERMINAL INDEX

The Igenity Terminal index is specialised to identify animals for terminal crossbreeding. It places the most emphasis on hot carcass weight, followed by marbling and rib eye area. There is, however, a negative emphasis placed on residual feed intake and fat thickness to control feed costs. This index is designed for producers who have an integrated system that uses terminal bulls on maternal-focused cows and/or retain ownership of progeny to harvest on a grid.

- Substantial increases in terminal traits including average daily gain, weight traits, rib eye area, and marbling.
- Mild effects on birth weight and calving ease.

CUSTOM INDEX OPTIONS:

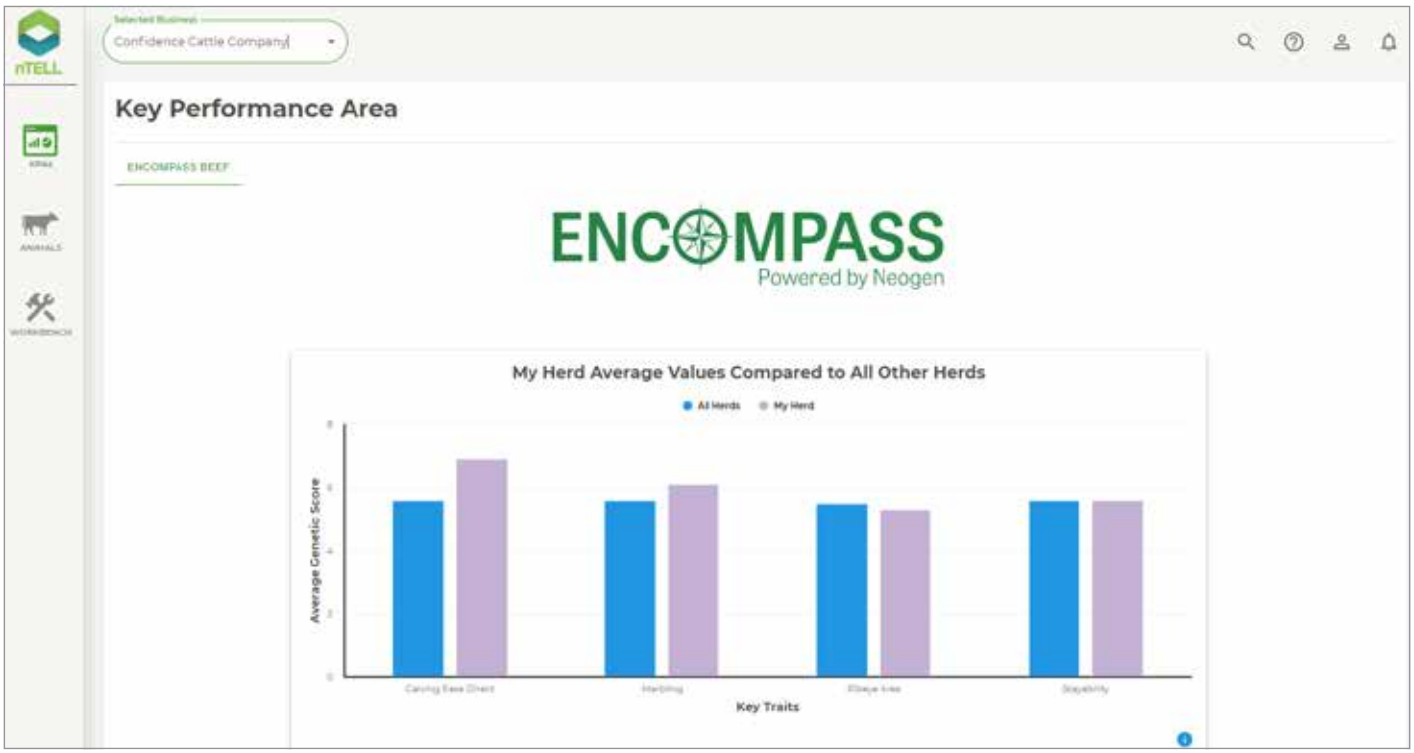
If the pre-made indexes do not reflect your goals, you can create your own index at **igenitybeefdashboard.com**.



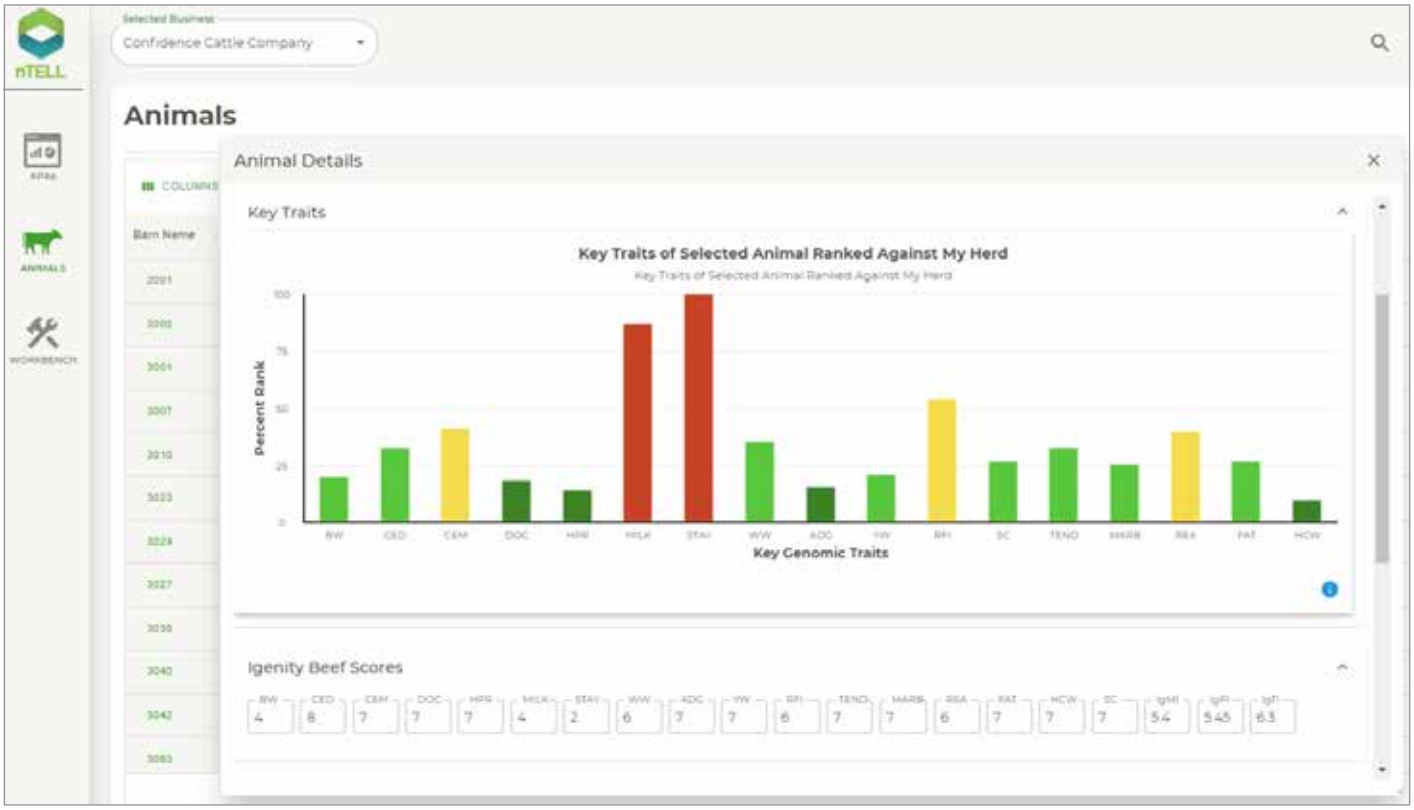
This chart shows how using Igenity profiling to identify the top heifers for stayability and mating them to bulls in the top 5% of their respective breed can improve cow longevity in just two generations. The black line indicates the initial distribution of Igenity stayability scores in the starting generation of cows in the herd. The red and green lines show the Igenity stayability scores for the second and third generations of females that result from mating bulls in the top 5% of their respective breed to heifers in the top third for stayability. Shifting the scores to the right indicates more cows will stay productive in the herd for a longer period of time. You can make similar advancements in other traits you wish to improve in your herd by profiling young heifers and using the information to make more informed selection and breeding decisions.

ENCOMPASS: IGENITY BEEF DASHBOARD

Encompass allows you to sort and filter results and visualize your data in the form of easy-to-read graphs and charts. Each farm gets their own dashboard.



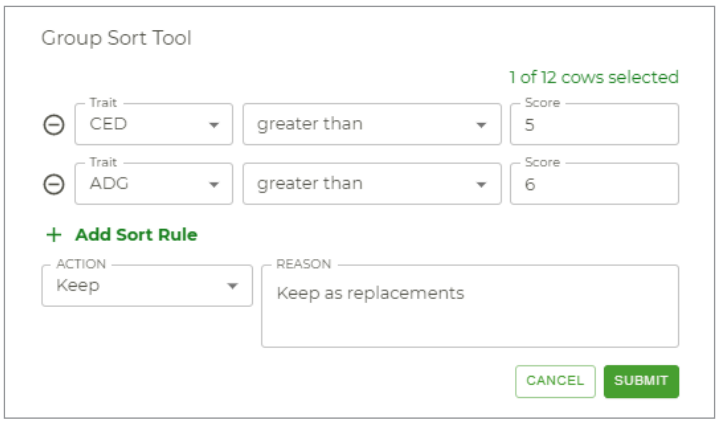
Logging into your Igenity® Beef Dashboard account gives you access to DNA test results, details of DNA reports, and profiling tools, all created to enhance decision making.



USE ENCOMPASS TO COMPARE, RANK, AND SELECT CATTLE THE IGENITY BEEF DASHBOARD WILL HELP YOU

EVALUATE THE DNA OF YOUR COMMERCIAL BREEDING STOCK

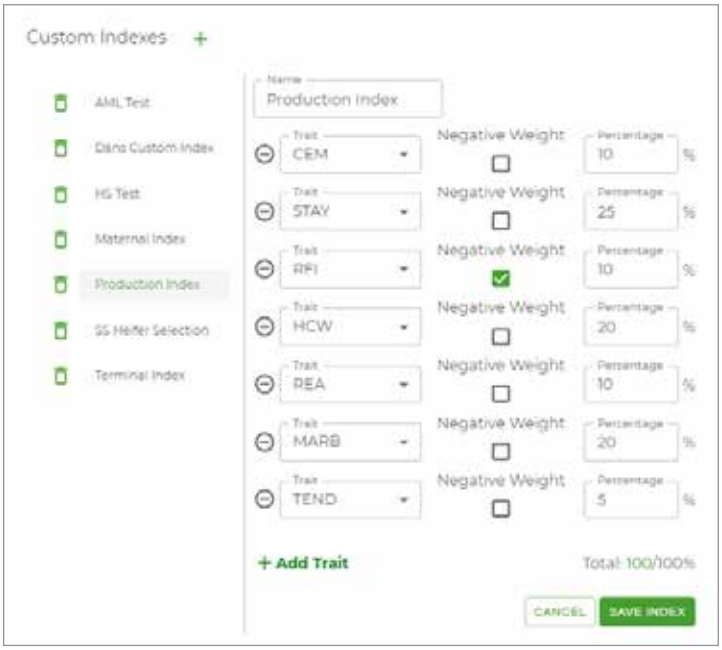
You can call up herd reports and assess their maternal, performance, and carcass traits. Use the site to sort cattle, compare them to herd mates, and benchmark against other herds in the database. By using the site tools, you can easily see patterns, strengths, and areas needing improvement. Igenity dashboard index sorts and ranks cattle using multiple traits in a simultaneous fashion. In a few moments, you have a prioritized ranking of calves for selection and management decisions



ENCOMPASS SORTING TOOL

This tool is designed to speed up your analysis process.

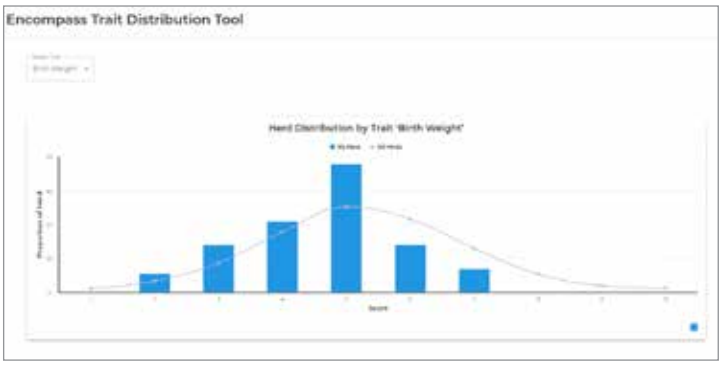
The concept is simple: select traits and minimum thresholds and move groups of animals to a sorted (or unsorted) status. The tool even tells you how many animals qualify for each grouping, before you decide! And – you can apply a 'reason' to each group to easily remember why you made your decisions.



INDEXES

Encompass features three pre-made indexes (maternal, production & terminal) as well as a custom index builder to help sort your animals.

We understand that not every farm is the same. The custom index builder allows you to create an index tailored to your production and grazing goals and your environment. Create an index in seconds and save it for your future use.



ENCOMPASS TRAIT DISTRIBUTIONS TOOL

This tool allows you to benchmark your animals (blue bars) against the entire Igenity database.
Identify high potential cattle, pinpoint strengths and weaknesses of your herd, and use that insight to help buy bulls.

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FOR MORE INFORMATION CONTACT:

ELLA HOLLAND, National Territory Manager | **M:** 027 386 2410 | **E:** Ella@pbbnz.com

PBB, PO BOX 503, 75 South Street, Feilding 4702 | **P:** 0800 248 247 | **E:** info@pbbnz.com | **www.pbbnz.com**

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