

The Comprehensive Igenity Profile



Igenity provides the beef industry with the most comprehensive genetic profile of multiple traits of economic importance. The insights gained from an Igenity profile help producers make more confident selection, management and marketing decisions.

The Igenity profile includes multiple-marker analyses for traits, such as:

- Residual feed intake
- Average daily gain
- Tenderness
- Marbling
- Quality grade
- Yield grade
- Fat thickness
- Ribeye area
- Heifer pregnancy rate
- Stayability/longevity
- Calving ease
- Docility
- Myostatin
- Coat color
- Breed-specific horned/poled
- Multisire parentage
- BVD-PI diagnostic test

Scores from Igenity

To assist cattle producers in understanding the value of DNA technology, Igenity has developed a scoring system for each trait using a scale of 1 to 10. Higher values are not necessarily better — they simply indicate the animal has the potential for more of that trait.

The values listed in the chart below reflect the relative difference expected in animals compared with contemporaries with a score from Igenity of 1.

Igenity — Comprehensive. Practical. Powerful.

The analyses included in the Igenity profile represent some of the most economically important traits in cattle production. Traits like heifer pregnancy

rate and stayability have a direct impact on cow/calf producers' bottom line. However, knowing inside information about carcass traits also can help producers be more profitable while helping the industry produce a more consistent end product. Below is a short explanation of the analyses represented in the profile and their associated values.

Feed efficiency

The Igenity Feed Efficiency analysis predicts genetic potential for Residual Feed Intake (RFI). RFI describes an animal's feed intake above or below its predicted needs for maintenance and growth.¹ An animal with a low RFI score will eat less to achieve the same gains, gain more on the same amount of feed, and require less feed to maintain body condition as a mature adult.

The results of Feed Efficiency combined with ADG give you a powerful look at an animal's ability to grow efficiently, maintain body condition as a mature animal and have efficient offspring.

Results are specific to *Bos indicus* or *Bos taurus*.

DMI defines an animal's genetic potential to consume feed, which is key for predicting feedyard performance or maintenance energy requirements. The actual feed intake will vary with the animal's growth stage.

Tenderness

The analysis in the Igenity profile for tenderness represents an animal's genetic potential for tenderness as measured by Warner-Bratzler Shear Force (WBSF), with 10 being the most tender and 1 being the least tender. Lower shear force means more tender beef.

Igenity profile results and associated effects**

IGENITY Result	Residual Feed Intake (Indicus)**	Residual Feed Intake (Taurus)**	Average Daily Gain***	Tenderness in lbs. of WBSF	USDA Marbling Score	% Choice & higher	Yield Grade	Back Fat Thickness (in)	Ribeye Area (in ²)	Heifer Pregnancy Rate (%)	Stayability (%)	Maternal Calving Ease (%)	Docility
10	5.5	4.2	0.81	-2.3	161.4	64.4	1.35	.37	2.56	18.8	16.7	9.5	45.4
9	5.0	3.6	0.72	-2.0	141.3	57.2	1.21	.32	2.22	16.2	14.7	8.4	39.6
8	4.2	3.1	0.64	-1.9	123.6	50.1	1.07	.28	1.93	14.2	12.9	7.3	34.7
7	3.6	2.7	0.54	-1.5	106.4	42.9	0.92	.24	1.64	12.1	11.2	6.2	30.0
6	3.0	2.2	0.44	-1.2	88.4	35.8	0.76	.21	1.35	10.0	9.5	5.1	25.3
5	2.4	1.8	0.34	-1.1	70.6	28.6	0.61	.17	1.07	8.1	7.6	4.1	20.5
4	1.9	1.3	0.24	-0.8	53.3	21.5	0.46	.13	0.80	6.0	5.8	3.1	15.7
3	1.2	0.9	0.14	-0.4	35.5	14.3	0.31	.09	0.53	4.0	3.9	2.0	10.7
2	0.6	0.4	0.05	-0.2	17.7	7.2	0.15	.06	0.24	1.9	2.5	1.0	5.8
1	0	0	0	0	0	0	0	0	0	0	0	0	0
P-value	5.7 x 10 ⁻¹³	8.04 x 10 ⁻⁸	2.4 x 10 ⁻¹⁹	1.9 x 10 ⁻⁸	3.8 x 10 ⁻¹⁸	1.0 x 10 ⁻²⁰	1.6 x 10 ⁻¹⁶	3.9 x 10 ⁻²⁰	1.8 x 10 ⁻¹⁴	2.6 x 10 ⁻³⁰	1.1 x 10 ⁻³⁴	4.2 x 10 ⁻³²	3.1 x 10 ⁻¹⁹

*Data on file at Merial. Results expressed represent differences expected in animals compared with contemporaries with Igenity profile scores of 1.

**Lbs. of feed per day.

***Lbs of gain per day.

WBSF + Warner-Bratzler Shear Force

In a group of animals with a score from Igenity of 10 for tenderness, 2.27 pounds less shear force is required than an animal with a score from Igenity of 1.

Marbling score

Higher scores from Igenity for marbling equal greater genetic potential for marbling. In a group of animals with a score from Igenity of 10 for marbling, the average marbling score can be expected to be 161.4 points greater than animals with a score of 1. The USDA beef grading system for marbling uses a 100 to 999 point scale. Marbling points reflect how much intramuscular fat is present in each carcass, and thus the potential to grade USDA Choice. The minimum marbling requirement for USDA Choice carcasses is 400 units. Each marbling score has 100 units. Therefore the 161.4 unit range between 1 to 10 scores from Igenity equals almost two full marbling scores.

Quality grade (percent USDA Choice)

Higher scores from Igenity for quality grade equal greater genetic potential to grade Choice or higher. In a group of animals that possess a score from Igenity of 10 for quality grade, it is likely that 64.4% more animals will grade USDA Choice (or higher) than a group of animals that have a score 1 from Igenity.

Yield grade

Higher scores from Igenity for yield grade equal a genetic potential for a higher USDA yield grade. A group of animals with a score from Igenity of 10 for yield grade can be expected to receive a yield grade score that is 1.35 units of a grade higher (less favorable) than animals that receive a score of 1 from Igenity.

Fat thickness

Lower scores from Igenity indicate less external fat, while higher scores reflect more external fat. In a group of animals with a score from Igenity of 10 for fat thickness, the average fat thickness is expected to be 0.37 inch greater than in a group of animals that have a score of 1.

Ribeye area

Higher scores from the Igenity profile reflect larger ribeye areas and lower scores reflect smaller ribeye areas. In a group of animals with a score from Igenity of 10 for ribeye area, the average ribeye is expected to be 2.56 square inches larger than in a group of animals with a score of 1.

Heifer pregnancy rate

Higher scores from the Igenity profile for heifer pregnancy rate mean a higher percentage of heifers

should become pregnant during the breeding season, which is measured at the first pregnancy check. In a group of heifers with a score of 10 from Igenity, 18.8% more of them are expected to become pregnant than a group of heifers with a score of 1.

Stayability

The analysis for stayability from the Igenity profile represents a female's ability to remain in the herd until six years of age or beyond. In a group of heifers with a score of 10 from Igenity, 16.7% more of them are expected to stay in the herd until six years of age than a group of heifers with a score of 1.

Calving ease

Higher scores from the Igenity profile for calving ease mean a higher percentage of unassisted births. A score of 10 from the Igenity profile represents 9.5% more unassisted births than a score from Igenity of 1.

Docility

Higher scores from the Igenity profile indicate a higher percentage of calves that possess calmer behavior. A group of calves with a score of 10 from the Igenity profile means 45.4% more calves will possess acceptable behavior than a group with a score of 1.

Myostatin

Myostatin, as part of the Igenity profile, analyzes for nine different variants of the myostatin gene, even though some may not be found in all breeds. Six variants are classified as "disruptive"; these cause muscle hypertrophy (double-muscling), larger birth weights, increased dystocia and enhanced tenderness. Three myostatin variants are referred to as "missense," and will increase muscularity and reduce external and intramuscular fat, with no change in birth weight. For all myostatin variants one copy is intermediate.

Coat color

The Igenity profile identifies the genotype combination that determines coat color. The black (ED) gene is dominant over red (e). Black animals may carry one copy of the black gene (called heterozygous) or two copies of the black gene (homozygous). Only homozygous black animals will have 100% black offspring.

Wild Type (E+) is neutral to red and black, and generally allows the expression of the other gene.

EDED Homozygous Black	EDE+ Black Carrier, Wild Type
EDe Red Carrier	E+e Red Carrier, Wild Type
ee Red	E+E+ Wild Type, Any Color

For more information about Igenity, visit www.igenity.com or call 1-877-IGENITY.

¹Carstens GE, Tedeschi LO. Defining feed efficiency in beef cattle. Presentation at Beef Improvement Federation Conference. 2006. Available at: <http://www.bifconference.com/bif2006/pdfs/Carstens.pdf>. Accessed May 26, 2008.

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