



# Profile Results Key for Beef

The **IGENITY** Beef Profile uses a single DNA sample from an animal to make a number of genetic tests. The results of these tests enable beef producers to make breeding, selection and management decisions with greater precision and confidence than ever before.

## **CARCASS QUALITY**

The **IGENITY** profile scores for Quality Grade and Marbling reflect an extremely powerful multiple marker analysis that indicates an animal’s potential for AAA Quality Grade or better carcasses.

### **Marbling Score And Quality Grade**

Canadian AAA grading has the same minimum marbling requirements as for USDA Choice. The USDA marbling score is based on a 999 point scale. In a group of animals with an **IGENITY** profile score of “10” for Marbling, the average marbling score can be expected to be 161 points greater than animals with a score of “1”. The **IGENITY** Marbling score is useful in deciding between animals with similar marbling EPD’s or ultrasound data. Marbling points indicate how much intramuscular fat is present in the carcass, and thus contribute to the propensity to grade Canada AAA.

The **IGENITY** profile for Quality Grade indicates differences in magnitude that marbling score will contribute to Quality Grade. More specifically, a group of animals with a Quality Grade score of “10” can be expected to have 139 more marbling score points contributing to Quality Grade than a group of animals with a Quality Grade score of “1”.

## **CARCASS COMPOSITION**

The **IGENITY** profile scores for Yield Grade, Hot Carcass Weight, Ribeye Area, and Backfat Thickness are calculated using multiple DNA markers that reflect the animals’s genetic potential for these traits. These results provide a more complete picture of the Carcass Composition potential for an animal.

### **Yield Grade**

Lean yield is an estimation of the percentage of the carcass that is red meat; it is not dressing percentage. When a carcass grades A or higher in Canada it also is graded for yield. A group of animals with an **IGENITY** profile score of “10” for Yield Grade can be expected to receive a Yield Grade score that is 1.3 of a grade higher than animals that receive a score of “1”. Lower **IGENITY** profile scores reflect higher percent red meat yield (Y1 being the highest yield possible). Higher **IGENITY** profile scores reflect lower red meat yield (Y3 being the lowest yield possible).

<b>Yield Grade</b>	<b>Estimated Yield (%)</b>
<b>Canada 1 (Y1)</b>	<b>&gt; 59 %</b>
<b>Canada 2 (Y2)</b>	<b>54 - 58 %</b>
<b>Canada 3 (Y3)</b>	<b>&gt; 53 %</b>

### **Hot Carcass Weight**

In a group of animals with an **IGENITY** profile score of “10” for Hot Carcass Weight, the average hot carcass weight is expected to be 52.5 lbs. greater than animals that score “1”. Lower **IGENITY** profile scores reflect lighter carcasses, higher scores reflect heavier carcasses. Carcass weight profile scores are related to expected differences in carcass weights assuming the cattle are harvested at the same fat thickness.

### **Ribeye Area**

In a group of animals with an **IGENITY** profile score of “10” for Ribeye Area, the average Ribeye Area is expected to be 2.6 square inches greater than animals that score “1”. Lower **IGENITY** profile scores reflect smaller ribeye areas, with higher scores reflecting larger ribeye areas.

### **Back Fat Thickness**

In a group of animals with an **IGENITY** profile score of “10” for Back Fat Thickness, the average back fat is expected to be 0.37 inches (9.4 mm) greater than animals that score “1”. Lower **IGENITY** profile scores indicate less external fat, while higher scores reflect more external fat.

**A MINIMUM OF 2 MM OF BACKFAT IS REQUIRED TO GRADE A OR BETTER IN CANADA.**



# Profile Results Key for Beef

## Tenderness

The **IGENITY** profile score for Tenderness represents an animal's genetic potential for tenderness as measured by the Warner Bratzler Shear Force test (WBSF), with "10" being the most tender and "1" the least tender. Less shear force means more tender beef. In a group of animals with an **IGENITY** profile score of "10" for Tenderness, 2.3 lbs. less shear force is required in the WBSF test than animals with an **IGENITY** profile of "1". Higher **IGENITY** profile scores represent animals that are more tender than those with lower scores.

## MATERNAL AND REPRODUCTIVE TRAITS

Reproduction is arguably the most economically important trait for Cow/Calf producers.<sup>1</sup> Heifer Pregnancy Rate indicates a heifer's chance at becoming pregnant over a normal breeding season, relative to other heifers. Stayability indicates the chance a heifer will remain in the herd until at least six years old, relative to other animals. Maternal Calving Ease is measured as the percentage of unassisted births – a higher value indicates greater calving ease. These **IGENITY** profiles can be used to make replacement heifer decisions as well as be used to select future maternal sires.

## DOCILITY

Calm cattle are not just about handler safety – calm cattle eat more<sup>2</sup>, have better response to vaccinations and preconditioning<sup>3</sup>, and are more tender<sup>4</sup>. The **IGENITY** profile for docility indicates the animal's genetic potential to be extremely calm, or to have calm offspring. Higher **IGENITY** scores for this trait indicate a higher likelihood that calves possess acceptable behavior.

### IGENITY PROFILE RESULTS AND ASSOCIATED VALUES.

#### What an IGENITY profile means.

**IGENITY** profile scores range from a low of 1 to a high of 10 for each economically important trait analyzed.

IGENITY profile results and associated values*											
IGENITY Result	Tenderness in lbs. of WBSF	Marbling Score	Based on Quality Grade	Yield Grade	Hot Carcass Weight lbs.	Back Fat Thickness in Inches	Ribeye Area in Square Inches	Heifer Pregnancy Rate (%)	Stayability (%)	Calving Ease (%)	Docility (%)
10	-2.3	161.4	139	1.35	52.5	0.37	2.56	18.8	16.7	9.5	45.4
9	-2.0	141.3	120	1.21	46.7	0.32	2.22	16.2	14.7	8.4	39.6
8	-1.9	123.6	105	1.07	40.7	0.28	1.93	14.2	12.9	7.3	34.7
7	-1.5	106.4	90	0.92	34.8	0.24	1.64	12.1	11.2	6.2	30.0
6	-1.2	88.4	76	0.76	29.0	0.21	1.35	10.0	9.5	5.1	25.3
5	-1.1	70.6	60	0.61	23.1	0.17	1.07	8.1	7.6	4.1	20.5
4	-0.8	53.3	45	0.46	17.2	0.13	0.80	6.0	5.8	3.1	15.7
3	-0.4	35.5	30	0.31	11.2	0.09	0.53	4.0	3.9	2.0	10.7
2	-0.2	17.7	15	0.15	5.3	0.06	0.24	1.9	2.5	1.0	5.8
1	0	0	0	0	0	0	0	0	0	0	0
P-value	1.9 x 10 <sup>-08</sup>	1.1 x 10 <sup>-05</sup>	1.5 x 10 <sup>-05</sup>	3.0 x 10 <sup>-12</sup>	5.0 x 10 <sup>-06</sup>	7.1 x 10 <sup>-13</sup>	7.3 x 10 <sup>-05</sup>	2.4 x 10 <sup>-07</sup>	7.5 x 10 <sup>-16</sup>	1.3 x 10 <sup>-20</sup>	6.4 x 10 <sup>-10</sup>

\*Data available on request. Results expressed represent differences expected in animals compared to contemporaries with IGENITY Profile scores of 1.

Revision 6  
SEPT. 4/08

1. JAS 84:2022-2025; 2. JAS 85:2382-2390; 3. <http://agnewsarchive.tamu.edu/dailynews/stories/ANSC/Jun1406a.htm>; 4. <http://agnewsarchive.tamu.edu/dailynews/stories/ANSC/Apr0504a.htm>



# Profile Results Key for Beef

## 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 animals (ED/ED) will breed true black. Wild Type (E+) is neutral to red and black, and generally allows the expression of the other gene.

ED/ED **Homozygous Black**  
ED/e **Black, Red Carrier**  
e/e **Red**

ED/E+ **Black Carrier, Wild Type**  
E+/e **Red Carrier, Wild Type**  
E+/E+ **Wild Type, Any Color**

## HORNED/POLLED

The **IGENITY** Horned/Polled analysis uses multiple markers to identify horned and polled animals. The Polled allele is dominant over the Horned allele, so animals can appear Polled despite carrying a Horned gene. The analysis is breed specific and each breed has a different set of markers involved. The results do not reveal the presence or absence of scurs.

HH **Homozygous Horned**  
HP **Heterozygous Horned/Polled**

PP **Homozygous Polled**  
I **Indeterminate – Homozygous Horned or heterozygous Horned Polled**  
(For “I” additional results may follow after further testing.)

## OTHER SERVICES AND RESULTS

### Bovine Viral Diarrhea – BVD Virus

This is a test for the presence of the BVD virus. Negative animals are free of the BVD virus. Positive animals have the virus present. If there is a positive test result, contact your veterinarian. Laboratory testing by your veterinarian to confirm or deny BVD Virus Persistent Infection should be done 30 days after the original **IGENITY** sampling.

### SR (Sample Rejected)

Samples may be rejected for many reasons including insufficient hair follicles, fecal contamination, excessive dirt, evidence of tampering, mould or other foreign matter.

### NR (No Result)

Some samples may look normal, but still are unable to produce acceptable results. This often occurs due to contaminants that are undetectable to the naked eye, dirt, mold or other foreign matter.

**For both SR and NR results, a new sample from the same animal can be resubmitted at no charge.**



# Profile Results Key for Beef

## VALIDATION PROCESS

The DNA markers in the **IGENITY** profile were discovered at North American universities or by the USDA and licensed for use by **IGENITY**. The markers are then analyzed in a minimum of 4 separate commercial populations with different environments, breeds and using multiple statistical models. The population sizes range from 800 to 6,000 head, totaling over 11,000 animals. Markers must have a similar, significant effect in all four populations in order to be launched as an **IGENITY** product. Additionally, we have confirmed the effects of the **IGENITY** profile in the 50,000 head Lariat population. **IGENITY** also provides *P*-values for each trait. *P*-values are the probabilities that the associations between the markers and the trait(s) are purely due to chance alone. Therefore, smaller numbers indicate stronger evidence supporting the fact that the markers indeed affect the trait. **IGENITY**'s *P*-values range from  $P=1.0^{-5}$  to  $P=1.0^{-20}$ , indicating an extremely high level of confidence. The *P*-values, in combination with the population size and diversity, are one of the best ways to determine how "real" marker results are from **IGENITY** tests being offered.

## SAMPLE IGENITY PROFILE RESULTS

**How to read an IGENITY profile.** One of the greatest values of the IGENITY profile is that all results are integrated and provided in one single profile, similar to the report shown here.

IGENITY Profile																	
Animal ID	M/F	Breed	Sample Barcode #	Tenderness	Red/Black Coat Color	Fat Thickness	Yield Grade	Ribeye Area	Carcass Weight	Quality Grade	Marbling	Calving Ease	Stayability	HeiferPregnancy	Docility	BVDV	Polled
701	M	-	nv011507_01	10	ED/ED	9	4	8	8	8	8	9	8	8	7	NEG	HH
702	F	-	nv011507_02	6	ED/ED	3	7	6	5	7	6	4	5	7	5	NEG	-
704	F	-	nv011507_04	10	ED/e	7	3	8	6	6	3	8	6	3	6	NEG	-
705	F	-	nv011507_05	6	ED/ED	3	5	6	5	5	6	5	6	5	8	NEG	-

\*Data available on request. Results expressed represent differences expected in animals compared to contemporaries with IGENITY Profile scores of 1.

Revision 4

## MULTI-SIRE PARENTAGE

**IGENITY** Multi-Sire Parentage is available without requesting the **IGENITY** Profile. For commercial producers this test determines the most likely sire of each calf when multiple sires are used for breeding animals on pasture. It helps to identify bulls that sire the most or fewest calves, identifies most likely sires of best- and worst-performing calves, and can calculate within-herd EPD's on traits of interest. Traits commonly included in a genetic evaluation include calving ease, weaning weight, yearling weight, heifer fertility, cow longevity, and carcass traits/grid value.

Seedstock producers can determine if calves are sired by clean-up bulls or AI; matching sires to progeny allows producers to run multiple sires in a single pasture.

Visit [www.igenity.com](http://www.igenity.com) for additional information, to order test kits and view your results online.

