

IGENITY[®] Results Key

for dairy

v2b

IGENITY[®] uses the power of DNA to help you understand and manage the potential for animals to perform and transmit traits of economic importance.

The comprehensive profile includes:

Fertility

Fertility can be a major driver of profitability for dairy farms – now you can know an animal's potential for fertility before you ever breed her! Measured in pregnancy rate, cows which score a ten as part of the IGENITY profile will have 5.2% higher pregnancy rates than cows with scores of one.

Dairy Form

Research has shown that cows high in dairy form are more susceptible to metabolic, reproductive and foot and leg problems¹. Dairy Form is closely related to productive life, especially through its effect on reproductive traits. Animals receiving a 10 score for Dairy Form as part of the IGENITY Profile, will have low dairy form – a good indicator of longevity.

Productive Life

Producers know that fewer than 60% of cows make it past their second lactation, but few know that the value of every extra month of Productive Life (PL) translates an additional \$29 profit per cow² – that is an extra \$2,900 profit per month for a 100 cow herd. The Productive Life analysis in the IGENITY profile uses multiple DNA markers to predict an animal's actual genetic potential for PL – and it works at any age.

Milk Production Traits

The IGENITY profile calculates scores for milk, fat, fat percent, protein and protein percent using multiple DNA markers. These markers identify genetic variations that help regulate milk yield, protein and fat content, without decreasing fertility. The combined results provide a more complete picture of an animal's production potential.

Somatic Cell Score

SCS is a profit driver for many producers as well as an indicator of potential for mastitis. Because IGENITY profiles can be used at any age, the IGENITY analysis for SCS can be used to identify calves and heifers with potential for high SCS and susceptibility to mastitis before they enter the parlor. An animal which scores a 10 for SCS has the potential for higher Somatic Cell Counts and may be more susceptible to mastitis than an animal with a 1.

Using the 1-10 Results

The one-to-ten scoring system provides a more definitive and focused profile. You can use the results to:

- Make more accurate breeding decisions
- Assist in heifer selection, whether buying, selling or keeping replacements
- Improve voluntary culling decisions
 - Select superior dams or donor animals
 - Adjust management practices
- Take inventory of your herd and establish a baseline for improvement.

The comprehensiveness of the IGENITY profile allows you to monitor the traits that are most important to your future profitability. Use this convenient scoring system in combination with published genetic evaluations (like PTAs and PAs) to benchmark and monitor the genetic progress in your herd.

Testing animals early in their lives provides a powerful genetic basis for the many breeding, selection and management decisions you will make through out their lifetimes.

Coat Color

The IGENITY profile identifies the genotype combination that determines coat color. The black (ED) gene is dominant over red (e). Wild Type (E+) is neutral to red and black, and generally allows the expression of the other gene.

E ^D E ^D	Homozygous Black
E ⁺ e	Red Carrier, Wild Type
E ^D e	Red Carrier
E ^D E ⁺	Black Carrier, Wild Type
ee	Red
E ⁺ E ⁺	Wild Type, Any Color



Cheese Production

Kappa casein

There are several forms of kappa casein – A, B and E – that are associated with milk protein and quality. These variants are related to renneting process for cheese production. Studies have also shown that cheddar cheese yield can be up to 8% higher and mozzarella up to 12% higher with BB milk versus AA milk³. The E variant has an adverse effect on cheese production.

BB: preferred result for cheese production

AB and BE: intermediate for cheese production.

AA and AE: least favorable result for cheese production.

Beta casein

Like kappa casein, there are several different forms of beta casein (A and B). Higher milk yield is associated with the A variant while higher protein and casein yields are associated with the B variant. Beta casein B is similar in effect to Kappa casein B.

Beta lactoglobulin

Beta lactoglobulin has a significant effect on casein number and cheese yield. The B variant has higher casein and cheese yields.

Beta lactoglobulin and Beta Casein

BB: most favorable result for casein and cheese yield.

AB: intermediate result for casein and cheese yield.

AA: least favorable result for casein and cheese yield.

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. This analysis is breed specific for purebred animals and each breed has a different set of markers involved. The results do not reveal the presence or absence of scurs.

HH: Homozygous Horned

PP: Homozygous Polled

HP: Heterozygous Horned/Polled

I: Indeterminate

IH: One Horned allele, one indeterminate allele

Genetic Diseases

A variety of inherited genetic defects are present in the population of the dairy breeds and routine tests are available to identify carrier animals.

Complex Vertebral Malformation (CVM)

Calves with two copies of the CVM gene can be reabsorbed, aborted or born dead. Stillborns are usually born premature and are diagnosed with dwarfism, or malformation. Carrier animals are normal, however may have reduced pregnancy rates when mated to other carriers

CV: CVM Carrier

TV: Non Carrier

Bovine Leukocyte Adhesion Deficiency (BLAD)

BLAD is a disease which results in impaired function of the white blood cells of the immune system. In order for an animal to demonstrate clinical signs of the disease, it must have two copies of the gene. Carriers (animals with one copy of the gene) are normal.

BL: BLAD Carrier

TL: Non Carrier

Deficiency of Uridine Monophosphate Synthase (DUMPS)

DUMPS is characterized by early embryonic death in animals that have two copies of the gene. Animals with one copy of the gene (carriers) are normal.

DP: DUMPS Carrier

TD: Non Carrier

Other Services and Results

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 NR results, a sample from the same animal can be resubmitted at no charge.

Bovine Viral Diarrhea Persistently Infected (BVD-PI)

This is a test for the presence of the BVD virus – positive animals have the virus present. If there is a positive result, contact your veterinarian. To be sure the calf is not transiently infected, submit a second sample from that calf 30 days later. If the second sample is positive, it is likely the calf is BVD-PI.

Visit www.IGENITY.com for more information, additional test kits, and to view your results online.

1. Dechow et al., Correlations Among Body Condition Scores from Various Sources, Dairy Form, and Cow Health from the United States and Denmark. JDS 2004, 87:3526-3533.

2. Van Raden and Multi-State Project S-1008. 2006. <http://www.USDA-AIPL.gov>. Accessed September 22, 2006

3. Fitzgerald, R.J. Exploitation of Casein Variants. "Milk Composition, Production, and Biotechnology." (eds. R.A.S. Welch, et al). 1972, pp.153-172. CAB International, Cambridge.

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IGENITY profile results and associated values*

IGENITY Profile Score	Milk Yield**	Fat**	Protein**	Dairy Form***	Productive Life (months)***	Somatic Cell Score	Fertility (%)
10	3521	133	77	-3.7	10.2	0.45	5.2
9	3088	117	68	-3.2	8.9	0.39	4.5
8	2709	103	59	-2.8	7.8	0.34	4.0
7	2334	89	51	-2.4	6.8	0.29	3.4
6	1951	74	43	-2.0	5.7	0.24	2.9
5	1570	59	35	-1.6	4.5	0.20	2.3
4	1188	44	26	-1.2	3.4	0.15	1.7
3	813	30	18	-0.8	2.4	0.11	1.2
2	434	16	10	-0.4	1.2	0.06	0.6
1	0	0	0	0	0	0	0

*Difference calculated based on IGENITY profile score 1.

**Production in pounds per lactation.

***Combine for enhanced longevity prediction tool.

What an IGENITY profile score means.

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