LEARNING GENOMICS

EDUCATIONAL ARTICLE SERIES

NEOGEN®

Don't Just Treat BRD. Breed Around It.

Few health challenges cost the cattle industry more than bovine respiratory disease (BRD). Through genomic selection, producers across sectors can now mitigate disease risk and its significant economic impact.

"Over 55% of calf mortality is due to pneumonia or bovine respiratory disease. While there is reduced risk in breeding-age cattle, we're still looking at over 12% of mortality caused by respiratory disease," says Kirk Ramsey, DVM, MS, professional services veterinarian at Neogen. "BRD is the No. 1 cause of morbidity and mortality in feedlot cattle amounting from $800 million to $1 billion annually."

Industry impacts include:

- Treatment costs
- Death loss
- Reduced average daily gain (ADG)
- Poor feed efficiency
- Carcass quality loss
- Subclinical BRD (a hidden loss driver)

Dr. Ramsey noted that the industry has spent more than 30 years working to reduce BRD—improving vaccine protocols, emphasizing prevention and investing enormous effort into management. Yet BRD continues to be one of the most persistent and expensive challenges in beef cattle.

Now, producers can select for BRD-resistant cattle.

Reducing Risk Using BRD Scores

Simple scoring system

The BRD trait is included with Igenity Beef results. The BRD score is intentionally simple: it's reported on a 1 to 10 scale and predicts genetic susceptibility to BRD. A higher score equals lower risk, while a lower score equals higher risk.

What does the variation in scores mean for cattle operations?

Significant variation in cattle

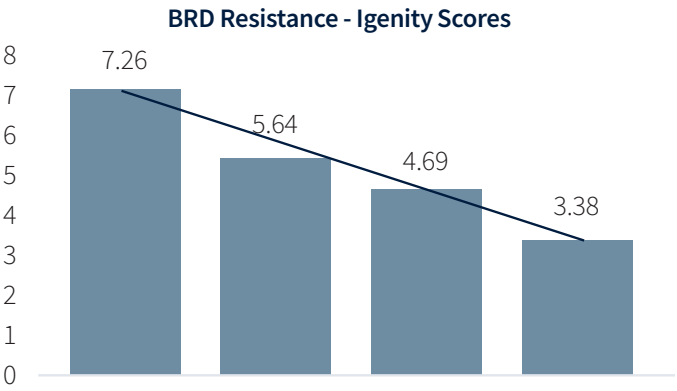
Scores	BRD Genetic Effects (%)
10	46.35
9	41.20
8	36.05
7	30.90
6	25.75
5	20.60
4	15.45
3	10.30
2	5.15
1	0

The Genetic Effect table translates scores into expected differences in BRD resistance potential between groups of animals. "Within the Genetic Effect Table, you can see that animals with a BRD score of 10 are expected to have a 46.35% greater probability of genetic resistance to BRD compared to animals with a score of 1. This allows producers to make more informed selection decisions using an intuitive scoring system," shares Victor Pedrosa, PhD, Director of Technical Genomics and Innovation at Neogen.

When referencing the BRD score, producers can make confident selection and management decisions that move herds forward.

Bovine Respitory Disease (BRD)	Igenity Score	Genetic Effect	Description
Animal A	8	36.05%	Animal A is expected to produce daughters with a 27.75% higher probability of being resistant to BRD compared to daughters of Animal B.
Animal B	3	10.30%	
		25.75%	

To further validate the effectiveness of the BRD genomic prediction, animals from a trial population of more than 5,000 animals were grouped into quartiles based on their BRD scores. The results showed a clear and biologically consistent trend – first, animals in the Top 25% averaged a BRD score of 7.26, and secondly, animals in the Bottom 25% averaged a score of 3.38.



"This indicates that animals, on average, in the Top 25% population group are expected to have 20% greater genetic resistance potential to BRD compared to animals in the Bottom 25%," shared Dr. Pedrosa.

Insight, not replacement

At its core, the Igenity Beef BRD score predicts an animal's genetic susceptibility to BRD, reflecting the genetic component of risk—not a diagnosis of BRD. Vaccination programs, nutrition and overall management and health protocols remain critical in successful BRD outcomes. Animals with more favorable scores are expected, on average, to be more resilient in environments where BRD is a challenge. The BRD score provides producers with another layer of information to make better, more informed decisions – made possible by supporting data.

Genomic Predictions and Data Behind the BRD Score

Real-world performance

Unlike controlled research populations, the BRD score was developed using large-scale commercial feedlot data — linking genomic profiles from more than 20,000 crossbred cattle directly to observed BRD treatment and mortality outcomes.

"That's what allows us to build predictions that reflect how cattle perform under real production pressure," said Kelsey Luebbe, PhD, Technical Services Genomics Livestock with Neogen.

Advanced modeling

A major strength of the trait is how the phenotype is defined. Instead of relying on subjective signs, it incorporates both BRD treatments (morbidity) and BRD deaths (mortality), capturing the true impact of disease. This means the score reflects not just whether an animal got sick but how BRD affected performance and survivability—making it biologically relevant and aligned with economic outcomes.

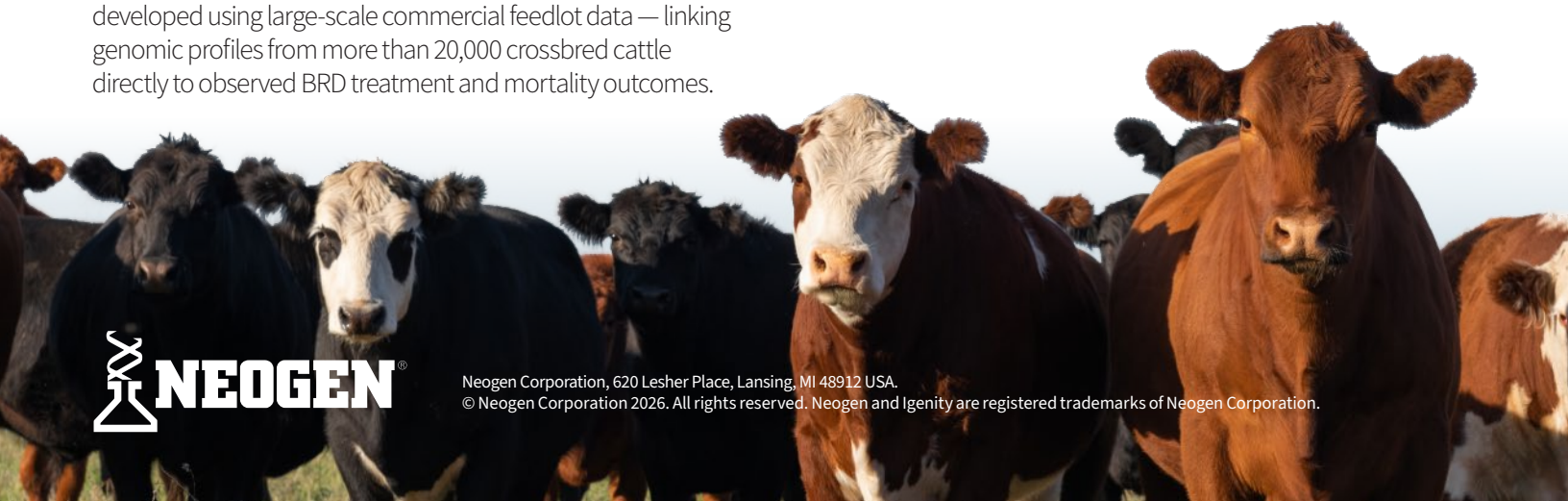
The observed probability for BRD phenotypes and genetic prediction values produced a 75% genetic correlation between genomic predictions and the actual BRD outcomes observed in the population – a remarkable level of consistency, driving value and confidence for producers. This means, "Animals with more favorable genomic predictions consistently showed a lower probability of BRD occurrence, supporting the robustness and predictive power of the model," shares Dr. Pedrosa.

Industry progression

BRD has an estimated heritability of 18%, meaning genetics play a meaningful role in disease susceptibility. With consistent selection over time, producers can make measurable progress toward building more resilient cattle. The BRD score allows producers to identify genetic differences in BRD susceptibility early and use that information to improve selection, sorting and overall herd health strategy.

When building BRD management strategies, genomics offers a practical and impactful way to make long-term progress.

Learn more at neogen.com
or contact us at
877-443-6489 | 402-435-0665
dnahelp@neogen.com



NEOGEN®