

# Championing a Healthy, Sustainable Future Through Genomic Testing

Dairy farmers and veterinarians have long played a critical role in sustainable food production using innovative approaches to improve animal health and productivity. At Zoetis, the most important commitment we make each day is to advance animal health. Genomic testing with **CLARIFIDE® Plus** from Zoetis is one of those tools that can help inform selection, breeding and management decisions, while also enabling fundamental operational changes to help improve overall herd health, efficiency and profitability.<sup>1</sup>

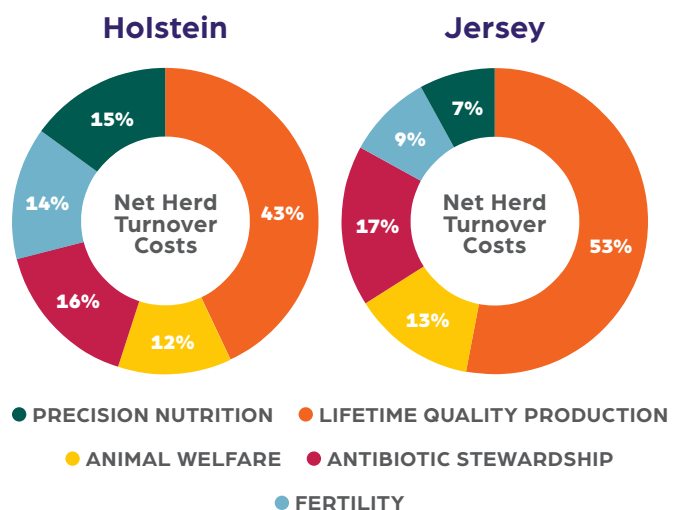


Since the introduction of genomic testing with **CLARIFIDE®** in 2010 and **CLARIFIDE Plus** in 2016, Zoetis has expanded these genomic tests to help farmers make strategic operational decisions proven to help improve dairy cow health and wellness while driving profitability and productivity based on genomic ranking and selection.<sup>1,2</sup> Zoetis brings innovation to the application of genomic testing by connecting how genetic improvements can help farmers work toward improving environmental, resource and operational sustainability outcomes.



## Building a Resilient Herd for Generations to Come

Only available through CLARIFIDE Plus, the Dairy Wellness Profit Index® (DWP\$®) is a unique and comprehensive animal ranking selection index that estimates the potential lifetime profit that Holstein and Jersey cattle will contribute to the dairy operation. This multitrait selection index reveals the value of critical wellness traits, including cow and calf wellness, production, fertility, functional type, longevity, livability, calving ability and milk quality traits, plus polled test results. In 2022, Zoetis updated the index to incorporate new traits that impact lifetime profitability, such as early first calving and residual feed intake. Zoetis also increased the economic values of fat, protein and milk, along with cow and calf wellness traits, to reflect current and future prices dairy farmers may experience. Incorporating DWP\$ into breeding and culling decisions helps dairy farmers create future generations of healthy, resilient animals that have the capability for higher lifetime profit when combined with best management practices.<sup>3</sup> DWP\$ is now composed of the following categories: animal welfare, antibiotic stewardship, precision nutrition, lifetime quality production and fertility.



## A Route to Improved Sustainable Outcomes

In a study analyzing **nine years of animal performance, genomic data and financial records from nearly 13,000 dairy cows across 11 U.S. dairies**, Zoetis uncovered a correlation between genetics and net farm income, sustainability and animal welfare. Zoetis experts used the updated DWP\$® to rank cows and assign them to two different genetic groups, here the differences between the superior 25% and inferior 25% are highlighted.

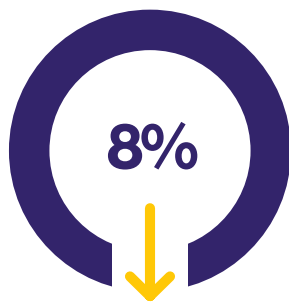
## Demonstrated Impact of Genetics on Sustainability, Production Efficiency and Animal Welfare

Study results below showed what cows in the superior 25% genetics group (compared with the inferior 25% genetics group) demonstrated across their lifetime:<sup>4</sup>

## Observing Positive Impacts Through Genetics and CLARIFIDE® Plus

This study summarizes the impact of genetics and CLARIFIDE Plus information on sustainability, production efficiency and animal welfare metrics in U.S. dairy cattle. These results indicate that CLARIFIDE Plus provides information and insights to lead sustainable intensification solutions by helping producers make the most efficient use of nonrenewable and on-farm resources, which can help sustain the economic viability of farm operations. In addition, identifying, selecting and managing dairy cattle using CLARIFIDE Plus information can help to deploy a preventive approach to animal health by identifying disease-resistant cows that would result in a responsible use of antibiotics and/or reduce the dependency on antibiotic usage.

The outcomes from this study illustrate and validate the impact of genetics, using DWP\$ from CLARIFIDE Plus, on improving efficiency, profitability and animal welfare, while decreasing emission intensity. This report also demonstrates that genetic selection for health and profitability is positively correlated to improvements in sustainability (as measured by methane emissions intensity), thus helping dairy producers to improve sustainable production practices over time without sacrificing animal health or profitability.



**REDUCTION  
IN METHANE  
EMISSIONS<sup>4,\*</sup>**



**MORE  
ENERGY-CORRECTED  
MILK<sup>4</sup>**



**FEWER ANTIBIOTIC  
THERAPY  
INTERVENTIONS<sup>4</sup>**

## Putting Numbers Into Perspective

The benefits of improving herd genetics span beyond dairy operations. Further analysis of the superior 25% genetics group compared with the inferior 25% genetics group in this study demonstrated a positive correlation between animal-level production and health data and environmental sustainability outcomes.

**Findings revealed that the superior 25% genetic group produced 1,228 pounds methane less per million pounds of energy-corrected milk annually than the inferior 25% genetics group.** These findings also show that a 1,000 cow dairy farm will need to raise 135 fewer replacement heifers than a herd made up of the inferior 25% of cows.



Raising fewer replacement heifers, as a result of improved genetic potential, and reducing methane production can help dairy farmers optimize their resources and decrease their herds' environmental footprint. Based on measurements against the Greenhouse Gas Equivalencies Calculator from the U.S. Environmental Protection Agency, this reduction in methane production translates to the real-world equivalents below.<sup>4,\*\*</sup>



**135 fewer replacement heifers.**<sup>4,\*\*</sup>

Resulting in a **15.7-metric-ton reduction** of methane emissions annually.<sup>\*\*\*</sup>

**This emissions reduction translates to these real-world equivalents:**



**909**

**Fewer barrels  
of oil consumed  
annually.**<sup>5</sup>



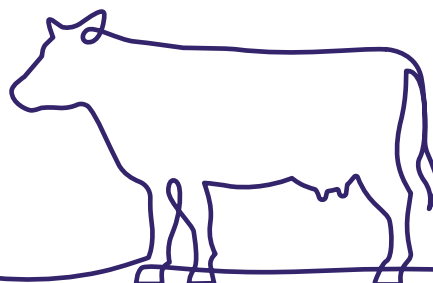
**76**

**Homes  
of electricity  
conserved annually.**<sup>5</sup>



**84**

**Gasoline cars  
removed from the  
road per year.**<sup>5</sup>





**Zoetis strives to drive innovation and transformation for healthy animals, healthy dairies and healthy food. Our genomic testing portfolio and research can help the dairy industry work toward a better, more sustainable future – from the milking parlor to the grocery store shelves.**

For more information, contact your Zoetis representative.

<sup>\*</sup> Ranked to estimate the associations between the selection index and each animal's enteric methane emission levels.

<sup>\*\*</sup> Replacement Heifer: Estimated based on the CLARIFIDE<sup>®</sup> Profit Planner

<sup>\*\*\*</sup> Methane Emissions: Assumes weight mean of CH<sub>4</sub> emission per day per replacement heifer over 24 months

<sup>1</sup> McNeel A., et al. Validation of genomic predictions for wellness traits in US Holstein cows. *J Dairy Sci.* 2017;100(11):9115-9124.

<sup>2</sup> Zoetis Data on File. April 2022.

<sup>3</sup> Fessenden, B., et al. Validation of genomic predictions for a lifetime merit selection index for the US dairy industry. *J Dairy Sci.* 2020;103(11):10414-10428.

<sup>4</sup> Di Croce F, Fessenden B, Weigel D. Championing a Healthier, More Sustainable Future Through Genetics, July 2022; Zoetis Inc.

<sup>5</sup> Greenhouse Gas Equivalencies Calculator, United States Environmental Protection Agency, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>. Accessed May 13, 2022.