CLARIFIDE – FOCUS ON WHAT MATTERS TO SELECT THE RIGHT HEIFERS

KEY TAKEAWAYS:

- There are many factors that influence genetic progress, including the intensity and accuracy of selection and the generation interval. Any change in these factors either improves or decreases the rate of genetic progress.
- Significant genetic progress can be made by using CLARIFIDE® to identify the genomic blueprint of each animal and rank them accordingly. Culling the bottom of the herd and increasing the number of offspring from the top of the herd raises the herd's average genomic profile.
- Data from commercial dairy herds prove that significant genetic progress can be made by utilizing CLARIFIDE to select the right females to act as a foundation for greater productivity.

UNDERSTANDING GENETIC CHANGE

Continually improving the genetics in your herd is key to enhancing long-term profitability.

The speed at which genetic change happens is affected by the intensity and accuracy of selection and the generation interval. The rate of genetic progress changes as these parameters are altered:

- As accuracy of selection (i.e., the reliability of the PTA or GPTA) increases so does genetic progress.
- When a producer selects a smaller percent of heifers to retain selection intensity increases along with genetic progress.
- As generation interval increases (holding all other factors constant) the rate of genetic progress decreases and vice versa.

It has been suggested that culling heifer calves or selecting for productive life (PL) will negatively impact genetic progress. The basis for this concern is the resulting increase in the average age of cows in the herd which, in turn, influences generation interval as it relates to the next generation of replacement females. While this sequence of events is correct, there is more to genetic progress than generation interval.

ENHANCING GENETIC PROCESS

Let's look at a sample herd. Consider a 1,000-cow dairy that, through sound reproduction and calf health management strategies, has been able to assemble an abundance of heifers available for replacements. Ignoring the potential impacts on profitability of maintaining surplus heifers, let's look at one of two approaches this producer might use.

- **Option 1:** Keep all available heifers and increase the replacement rate in the cow herd to make room for the additional heifers.
- **Option 2:** Maintain replacement rate but eliminate some percentage of the heifer population to maintain herd size.

When compared to Option 1, generation interval increases in Option 2 because fewer first-lactation animals are added to the population to pull down the average age of reproductive females in the herd. For a dairy with a 43% replacement rate, removing the bottom 15% of heifers and reducing replacement rate to 37% will increase generation interval in the subsequent generation by approximately seven months. Increasing the average age of parents may decrease genetic progress.

However, in Option 1 all heifers are kept as replacements, so there is no selection intensity. In this scenario the lower generation interval provides no benefit in heifer selection strategies. Yet Option 2 does contribute to genetic progress because there is selection intensity. In addition, using genomic technology to select replacements increases the accuracy of selection, further enhancing genetic progress.

REAL-WORLD DATA IS PROVING UNEQUIVOCALLY THAT GENETIC PROGRESS IS MADE BY SELECTING THE BEST ANIMALS AVAILABLE, REGARDLESS OF AGE.

THREE HERD EXAMPLES

We can look at data from three dairies to illustrate this point. The figures to the right illustrate the distribution of CLARIFIDE GPTA for Net Merit Dollars (NM$) in all 2012 and 2013 heifers from single herds.

This first herd has extremely good genetic merit for lifetime profitability—the **average** heifer ranks with the elite (top 2%) of the cows in the Holstein breed for NM$. Also, the rate of genetic improvement in this herd (NM$ 91/year) is phenomenal and reflects intensive use of Embryo Transfer on top of rigorous sire selection.

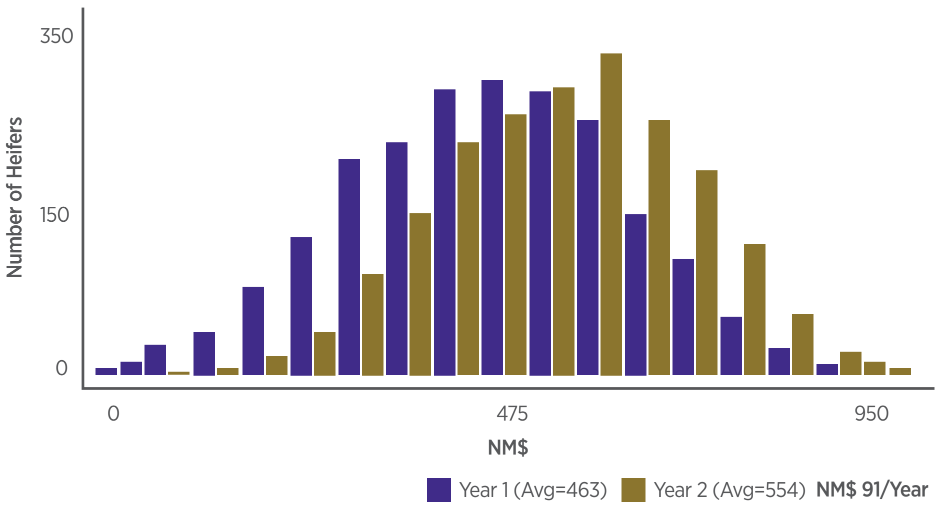
This sort of improvement is also seen in commercial dairies. Significant progress was made **in the second example,** with an improvement of 144 NM$ in one year. **In the third example,** while an improvement of 55 NM$ is significant, more aggressive heifer culling could lead to faster improvement.

Even with the rapid rate of genetic improvement, the highest heifers will be among the best in the herd for a long time. Conversely, some of the youngest heifers should be culled as they have lower genetic merit than the majority of the herd. Removing the bottom 15% of heifers in each year significantly improves average NM$.

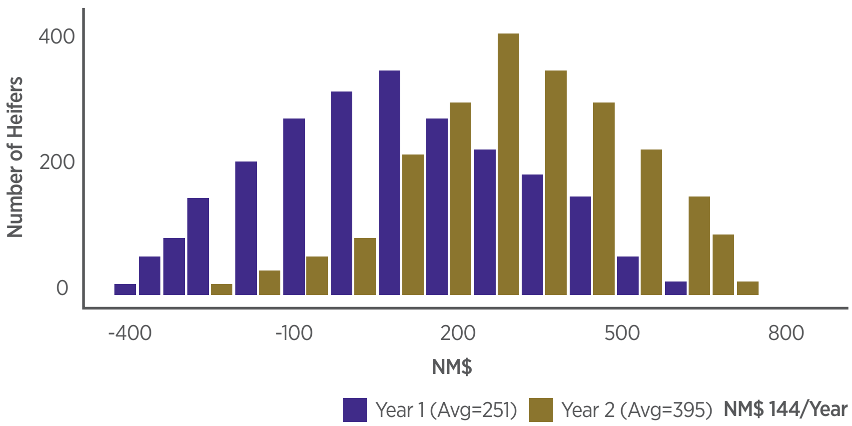
SUMMARY

This data confirms the importance of considering all factors impacting genetic improvement and not just generation interval. Optimizing profitability in commercial dairies is realized through strategies that maximize genetic improvement and efficiently manage heifer inventory. Minimizing generation interval is not essential to achieve significant genetic progress. The standard management paradigm of keeping all heifers, including those that have lower genetic potential, and removing good cows to make room is no longer an optimal economic practice. Effective genetic improvement strategies (i.e., those that improve profitability) must ensure that the heifers in development and cows in the parlor reflect the best genetics that dairy has to offer.

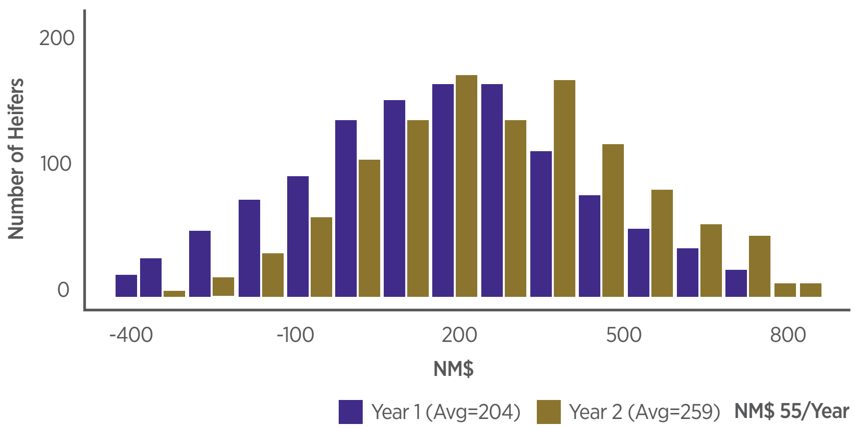
EXAMPLE HERD 1: DISTRIBUTION OF GPTA NM$ BY BIRTH YEAR



EXAMPLE HERD 2: DISTRIBUTION OF GPTA NM$ BY BIRTH YEAR



EXAMPLE HERD 3: DISTRIBUTION OF GPTA NM$ BY BIRTH YEAR



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