ASSOCIATION BETWEEN DAIRY WELLNESS PROFIT INDEX® (DWP®) PREDICTIONS AND LIFETIME PERFORMANCE

KEY POINTS

- This field study demonstrates the association between DWP predictions and lifetime performance measured as lifetime energy corrected milk (ECM) production per cow and lifetime days in milk
- On average, cows in the best DWP group (Best 25%) had £1,326 more Income Over Feed Cost (IOFC) when compared to the worst group (Worst 25%)
- In this study, cows in the best DWP group have produced 33,689 Kg energy corrected milk throughout their lifetime to date. During the same period, the worst DWP group produced 24,685 Kg energy corrected milk
- The higher lifetime milk totals of the best 25% based on DWP are due to both higher ECM per day (1.8 Kg more) and a longer time in the herd (202 additional days in milk) when compared to cows in the worst 25% DWP
- These results demonstrate that DWP predictions of young calves and heifers can be used to effectively predict future profit per cow expressed by lifetime energy corrected milk production.

INTRODUCTION AND OBJECTIVE

Selection indexes are critical to genetic improvement as they combine values for many traits into a single value that can be used to rank animals and inform breeding decisions. In 2016, Zoetis Genetics developed the Dairy Wellness Profit Index (DWP) to estimate the genetic potential for lifetime profit in Holstein and Jersey cattle.

DWP is a multi-trait selection index that includes production, fertility, functional type, longevity, calving traits, milk quality, livability, cow wellness, and calf wellness traits plus the economic value of polled test results. Through Genetic Audits by Zoetis, the predictive ability for actual herd performance for many of the underlying traits in DWP has been demonstrated for a multitude of customers. As some of the first heifers tested by Zoetis are now finishing their careers, we are now able to begin examining how well DWP predicted lifetime profit. These preliminary results are the first part of a larger effort to understand the association between index values and production economics.

DATA AND METHODOLOGY

Five large Holstein herds (n=2,175 enrolled cows) in the United States were chosen for this study because they had: (1) genomic predictions from females born in 2011, (2) recorded production, reproduction and health events to accurately estimate profit per cow (3) at least 200 animals born in 2011. Dairy Wellness Profit (DWP) predictions from 2012 were used to rank the 2,175 animals within herd and assign cows to percentile-based DWP groups (genetic groups: Worst 25%, 26–50%, 51–75%, and Best 25%).

Herd records were used to calculate lifetime energy corrected milk and income over feed cost (calculated using the following formula IOFC=Net Margin*Lactation Total Milk-(Lactation Days In Milk*Maintenance Cost Per Day) based on the actual performance from first calving through to when they left the herd. For cows that were still in the herd, current totals were used.

RESULTS

The Table below shows the association between DWP genomic ranking and Lifetime ECM (Kgs). When ranked by DWP, the top 25% of females produced 9,000 Kgs more lifetime ECM per cow than the bottom 25%.

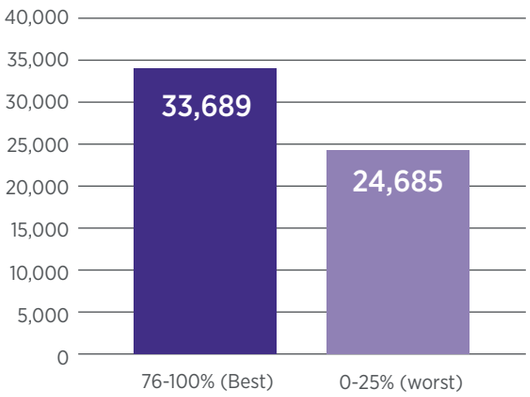
This additional lifetime ECM represents £1,326 additional Income Over Feed Cost (IOFC) per cow in the best 25% of females than the worst 25%. In the Lifetime IOFC calculation, the additional feed required for the higher milk production was accounted for and income was not discounted based on when it was generated.

CLARIFIDE® Plus DWP Ranking	Average DWP Value	Lifetime ECM (Kgs)	Lifetime IOFC per cow (£)	Lifetime Days in Milk (days)
76-100% (Best)	433	33,689	5,916	880
51-75%	282	30,868	5,772	822
25-50%	175	29,710	5,550	796
0-25% (Worst)	2	24,685	4,601	678
Difference between Best & Worst	**431**	**9,004 Kgs**	**£1,315**	**202 days**

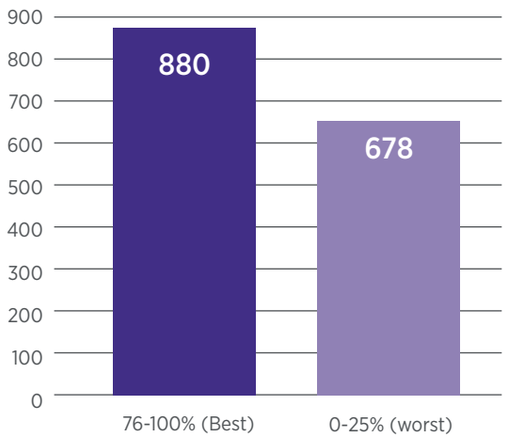
Figures 1 and 2 illustrate the difference between the best and worst quartiles for Lifetime ECM and Lifetime Days in Milk, respectively. The best DWP group produced on average 38.1 Kgs of milk per day for 880 days. This resulted in an average lifetime energy corrected milk production of 33,689 Kg. The worst DWP group produced on average 36.3 Kg of milk per day for 678 days.

Therefore, the cows in the best 25% based on DWP produced on average 1.8 Kg more ECM per day and did this for an additional 202 days in milk than the cows in the worst 25% DWP.

Lifetime Energy Corrected Milk Production (Kg)



Lifetime Days in Milk (Days)



SUMMARY

These results indicate that CLARIFIDE Plus and the Dairy Wellness Profit (DWP) predictions of young calves and heifers can be used to make informed predictions of future lifetime performance. Using DWP predictions for selection decisions can have an important financial impact on a dairy by increasing lifetime milk production, milk per day, herd life, and expected profit per cow.

This demonstrates that DWP is a genetic selection tool that provides highly relevant information to dairy producers that seek to improve the profitability of the dairy cattle they care for.

Exchange rate taken as $0.83 to £1 - at time of writing 18/05/20

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