

A NEW SOURCE OF GENETIC INFORMATION FOR THE DAIRY INDUSTRY

By Dr. David Selner

The April 2013 genetic evaluations were not released by the USDA-Animal Improvements Program Laboratory like they have been for many years. Instead evaluations were released by the Council on Dairy Cattle Breeding (CDCB) which is now in charge of providing genetic information to the dairy industry. The new agreement between the CDCB and USDA was reached just a few weeks before the release of the latest information. Not many details have been released about the total impact of the changes on the flow of genetic information or other details. However, information has been widely distributed as to how the new enterprise will be funded through added charges on genomic testing fees for the dairy industry, depending on a dairyman's level of cooperation in data collection activities.

Since all of the meetings of the CDCB over the last year have been held in private with no access for the public, there has been little opportunity to keep you informed of what was going on or what new things might be happening in the future. Hopefully now that the agreement is signed, open meetings will again be held with free flow of information. Perhaps the attention of the industry can now concentrate on providing future improvements like breeding values for feed efficiency, immune resistance, heat tolerance or hoof health. These are areas that other organizations and universities are already working on.

This April, many breeders were anxiously awaiting the chance to genomic test their males without having to go through a bull stud so that they could be free to market their bulls as they see fit. In reality the vast majority of males tested this time were already under the control of an A.I. stud. There was one free agent bull in the top 100 sires at number 38 and 4 more bulls in the top 200. The reality is that the A.I. studs do such an excellent job at developing high genomics it will be very hard for any breeder to keep up with these

extensive programs. A breeder can dream of developing the ultimate high sire but the odds are definitely not in your favor with this elite competition.

Evaluation Highlights

This year we have seen more sires that have gone from genomic to proven sire with real daughter performance. The highlight of this run was the validation of the No. 1 Genomic sire of August 2010 being graduated into the proven sire category as the new No. 1 TPI sire.

De-Su Observer at Select Sires now has 218 daughters milking in 115 different herds and vaults to the top with a +2332 TPI. Observer has really reached another level being a whopping 40 points higher than December's No. 1, Freddie. Observer is the first of what could be more Planet sons in the future. His life began in the Meyer herd in New Albin, Iowa with his dam being the Oman daughter De Su Oman 6121 VG-86 GMD DOM who is known around the world as a source of superior genetics. The next dam is an EX-90-2E GMD DOM BW Marshall. Observer is a high milk sire (+1602) that is plus for fat and protein percents. He sires extreme longevity (+7.2 PL) and can be used confidently for calving ease on heifers. He is a high type sire (+2.70 PTAT) and sires phenomenal udders (+3.02 UDC), strong fore udders, high wide rear udders with outstanding ligament and udder depth. The only thing you may have to watch is too close of teat placement and siring very short teats. Certainly those that used Observer as a genomic sire are very pleased with his daughters today.

A trend discussed in previous articles is the rapid change in the industry from using predominantly sires with proven daughter information to genomic sires with no milking daughters, only genomic enhanced information. This time the industry has provided list-

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SIRE SUMMARY

Table 1 August 2010 Top U.S. TPI Daughter Proven Sires

Sire	Aug 10 TPI	April 13 TPI	Aug 10 NMS	April 13 NMS
Freddie	2258	2292	794	779
Super	2173	2107	625	575
Man O Man	2149	2185	613	588
AltaIota	2135	2149	581	579
AltaRoss	2103	1946	610	500
Planet	2092	2176	623	721
Oman	2089	2000	696	643
Logan	2088	2039	619	564
Manifold	2072	2167	597	689
Bronco	2052	2077	542	512
Average	2121	2114	630	615

Table 2 Aug 2010 Top Genomic TPI Sires with 100+ milking daughters today

Sire	Aug 10 TPI	April 13 TPI	Aug 10 NMS	April 13 NMS
Observer	2359	2332	791	792
Domain	2292	2022	657	416
Bowser	2288	1940	689	455
Trigger	2273	2040	685	558
Explode	2237	2098	569	423
Gold Digger	2211	1990	652	513
Destry	2211	1940	601	340
Boxer	2210	1826	609	324
Sebastian	2206	1933	622	396
Jock	2184	2037	679	639
Average	2247	2016	655	486

ings of sires they are actively selling semen on that includes 588 proven Holstein sires and 1227 genomic Holstein sires. Just a short 2 years ago this was heavily weighted to the proven sire category.

Because the high end genomic sires easily surpass the best proven sires of the era on most marketing lists it seems natural that dairymen would gravitate to the higher value sires. Traditionally dairymen have seen great results from using the best of the best. However I think one also must be careful not to go too extreme in using this principle. Even though these genomic sires have additional information and higher reliability than traditional young sires they still do not equal the reliability of the information that is available on daughter proven sires. Looking back it was not too many years ago that some dairymen got unfavorable results when they over used low reliable breeder proven bulls to only find out that they did not fulfill their reputation.

Reliability of Genetic Evaluations

I thought it would be good to revisit this historical issue of reliability. Many in the industry have done genomic studies using August 2010 as a starting point because the genomic evaluations were more stable after that time than previous evaluations. These studies demonstrated that for the population, genomics has done an accurate job ranking the masses of dairy cattle. However the average dairyman does not use the population of sires he uses a selected group of sires. That choice now includes choosing between higher reliable proven sires or genomic sires.

Studies undertaken by *HolsteinWorld* have found that on over 300 sires with genomic information in January 2010 their early genomic value over estimates their 2013 genetic values now with milking daughters by about 180 TPI points and 150 NMS. To further study the choice of genomic versus proven sire I have done an analysis of August 2010 genomic and proven sires for this study.

I selected 10 of the highest U.S. proven TPI sires of the breed in August 2010 and next compared them to the top U.S. genomic sires of August 2010 who now have over 100 milking daughters. The 2 tables are above.

The top proven sires of August 2010 have remained very stable as expected and have provided very reliable results for those dairymen that choose to utilize them heavily. The top genomic sires of 2010 also remained high and the system accurately predicted the top proven sire of today. So you can see that genomics does work in predicting performance. However if reliability or predictability is your strong preference then selecting only genomic sires will not necessarily guarantee the same uniform overall results as using top proven sires.

The industry seems to be over focused on producing the highest sire or genomic heifer and that this should be the goal of every dairyman. Certainly this is a worthy goal and one that can be very lucrative, as you see the extremely high prices being paid for high genomic females. But in the real world of milking cows unless you are willing to spend large amounts of money on utilizing every reproductive tool, being able to have a source of the latest high genomic males and turning over generations very quickly your odds of keeping up with the major A.I. studs (the experts at this game) are very slim. I think it is important that every dairyman take a close look at what he truly desires in his breeding program and how much risk he is willing to take and then make an informed decision. I do not believe that every dairymen needs to follow the same model as someone whose goals of providing bulls to A.I. is their major goal. Breeding a highly productive, healthy, uniformly good uddered herd of cows can still be very rewarding.

Genomic Keys to Remember

If you are striving for the top end of the breeding industry and to be a source of high end genetics then it is important that you know the levels of the truly elite animals. After this run there are 287 bulls already tested that are over 2400 TPI with the top bull being +2620 TPI. On the female side there are 15 females over 2600 TPI and to be in the top 200 you have to be over 2460 TPI. The competition at the top end is very tough.

Table 3 Genetic Trends of the Holstein Breed from AIPL data

Cows Birth Yr	% Inbrding	DSB	DCE	PL	DPR	SCS
1990	2.53	8.7	9.6	-1.89	1.7	-0.09
1995	3.72	8.6	9.6	-0.99	0.56	-0.06
2000	4.55	7.9	8.5	-0.92	0.03	0.00
2005	5.15	7.1	7.5	0.00	0.00	0.00
2008	5.46	7.1	6.5	0.83	0.08	-0.08
2010	5.70	NA	NA	1.75	0.47	-0.15

The other thing that many genomic experts are using to help them generate more high-end genomic animals is to concentrate on the Direct Genomic Values (DGV) rather than the published genetic breeding value. This Direct Genomic Value is determined by the DNA analysis of a reference population of animals and then it is blended to the pedigree value to come up with the genetic breeding value. The AIPL scientists announced that for April 2013 they have lowered the weighting on the DGV by 5% for production and 10% for type because the prediction of actual performance by the official genetic breeding value was better with the lower DGV weighting. Even after this change the animals with higher DGVs still seem to provide many more genomic outliers than those with genomic values that closely mirror what the pedigree has shown to be actually produced. So if you are going to invest in high end genomics make sure you know what the DGV is before you purchase, if you want to increase your odds of success.

Holstein Trait Analysis

Finally, I would like to make a suggestion that the Holstein breed take a much stronger look at two Holstein breed problems, inbreeding and still births. Many of the changes in emphasis in breeding programs have yielded positive progress in health traits, type and production but these two traits still have not shown the progress we need in my opinion. A

look at genetic trends over time may help you visualize my concerns.

Over the last 20 years we have seen a constant rise in the inbreeding of the female population. Now this may not be catastrophic yet, but the trend is still very troubling. Unless there is a real effort to control this trend, potential problems could surface in the future. The other problem is cows giving birth to dead calves, or calves that die within 48 hours. This problem has decreased but deaths are still higher than I think is acceptable. The calving ease on those same cows has shown a much higher percentage drop than the livability of their calf.

The traits of Productive Life, Daughter Pregnancy Rate and Somatic Cell Score have all shown a drop after 1990, but recently with more emphasis being placed on these traits the trend has been reversed and for somatic cell score it is now even better than it was 20 years ago. More progress can be made we just have to put more emphasis on other important traits with the appropriate weighting.

In summation, a new era in the delivery of genetic evaluations by the industry has arrived. I believe even more changes to genetic evaluations and our data collection systems will occur in the future. Being knowledgeable of the changes, trends and economic costs and benefits of genetic progress will be very important to your future success in the dairy industry. □

**Watch for the next Sire Summary updates
in the September Issue of HOLSTEINWORLD**