

Breeding for a healthier herd

In addition to the information that will be available from the Council on Dairy Cattle Breeding later this year, several dairy companies have already taken the lead in providing options for dairy producers to improve herd health through genetic selection. Descriptions of the traits and/or indices, along with their respective data sources and collection methods, are provided from seven major breeding companies and one animal health company in the chart below.

| Product | Description | How data is collected |
|--|---|--|
| TransitionRight ABS | TransitionRight is a proprietary economic index using genomic evaluations for three traits: mastitis, metritis and ketosis. It also utilizes global dairy industry evaluations on important fertility and calving traits relevant to the transition period. | ABS analyzes more than 40 million cow records from 1,700-plus herds (average size of 1,500 cows and greater) worldwide to generate this index. The data set includes between 2 and 5 million health records from the first 60 day postpartum of first lactation of Holstein cattle for mastitis, metritis and ketosis. Scientific papers have shown that reviewing first lactation cows is a preferred way of predicting potential disease. Each trait gets an appropriate weight in the index based on the cost of treatments specific to the transition period which, when coupled with proper weights for fertility and calving traits, shape the final index. Ultimately, it allows producers to strategically choose sires that enhance the transition health of their herd. |
| Productive Life Alta Genetics | When healthier cows are the goal, producers can include Productive Life as part of a complete, customized genetic plan for their farm. Individual herd genetic assessments prove that genetic selection for higher PL leads to fewer health events like RPs, DAs, mastitis, lameness, milk fever and others. When a producer puts a customized genetic plan in place on their dairy with some emphasis on improved PL, they will create a next generation of healthier cows without sacrificing on the production or conformation traits that matter to them to achieve their goals. | PL is measured as the total number of additional or fewer productive months that you can expect from a bull's daughters over their lifetime. Cows receive credit for each month of lactation, with more credit given to the first months around peak production, and less credit given for months further out in lactation. More credit is also given for older cows than for younger animals. PTA PL is computed using a combination of DHIA culling data and production traits calculated by CDCB. |
| Better Life Health CRV | The Better Life Health index is made up of several proprietary traits under the label of CRV HerdBuilder traits through years of collecting on-farm and genomic data. Specific health concerns addressed are: sole hemorrhage, Mortellaro, (inter) digital dermatitis, white line defect, sole ulcer and interdigital hyperplasia (presented in a hoof health index), clinical mastitis, subclinical mastitis and ketosis. Breeding values are also published for calf survival, a trait that goes beyond the stillbirth window and focuses on survivability from day 3 to 365 of life. | Health event data is collected from farms all over the world through the company's own milk recording centers, on-farm software, type classification and partnership with Wageningen University, Liege University and the University of Melbourne. With over 30 years of data, millions of highly accurate records are used to calculate the HerdBuilder traits utilizing both phenotypic and genotypic data. On-farm digital apps are used for health traits that are then validated by technologies. Hoof health incidences are diagnosed and recorded by classified hoof trimmers through a digital lameness score. Clinical and subclinical mastitis are measured through somatic cell score patterns by mid-infra-red spectroscopy. Ketosis is measured by milk acetone and hydroxybutyric acid levels in milk. |
| Ideal Commercial Cow Index (ICCS) Genex | The Ideal Commercial Cow (ICCS) Index rewards Holstein and Jersey bulls that sire healthy commercial cows. The ICCS index is comprised of sub-indices that recognize the importance of health traits. The index for Holsteins consists of five sub-indices: Production Efficiency (PREFS), Health (HLTHS), Fertility and Fitness (FYFTS), Milking Ability (MABLS) and Calving Ability (CABLS). The ICCS index for Jerseys is comprised of three sub-indices: Cheese Maximizer (ChMAXS), Sustainability (SUSTS) and Fertility (FERTS). Both versions are directly tied to economic impact on the farm. Additionally, there are three proprietary health traits for Holsteins: Subclinical Ketosis (SCK), Metritis (MTR) and Foot Health (FH). Two proprietary health traits for Jerseys specifically are Calf Survivability (CSRV) and Age at First Calving (AAFC). These proprietary health traits are included in each breed's version of the ICCS index. All five of these health traits are set to a base of 100, with numbers greater than 100 leading to reduced incidence of the health concern. | Data sources for the ICCS index include the Council on Dairy Cattle Breeding, the Canadian Dairy Network and the CRI dairy research database (which consists of GENEX and AgSource Dairy data). The CRI dairy research database, used to calculate these proprietary traits, includes 54 million health records on nearly 12 million cows. Information comes from a full-service milk testing and dairy management information provider with more than 720,000 cows tested monthly. The database also includes genomic profiles, on-farm health and fertility records, and real-time production records. For Holsteins, Subclinical Ketosis (SCK) is based on KetoMonitor phenotype which is predicted blood BHBA values based on 14 data points including milk analysis and cow status and lactation information. Metritis (MTR) data is based on fresh cow metritis events up to 40 DIM. Foot Health (FH) data comes from multiple cow and heifer lameness events and sold/died events. For Jerseys, Calf Survivability (CSRV) data is reflective of the percent of female calves that survived past 120 days of age. Age at First Calving (AAFC) values are indicative of the heifer growing and maturing faster and being reproductively viable at a younger age. |
| Wellness Pro and Dairy Wellness Profit Index Select Sires and Accelerated Genetic | Select Sires uses the following health trait designation: Wellness PRO. These sires are identified using the Wellness Trait Index (WTS) through CLARIFIDE Plus genomic testing.* WTS focuses on the wellness traits: mastitis, lameness, metritis, retained placenta, displaced abomasum, ketosis and polled, and estimates expected differences in lifetime profitability related to them. The Accelerated Genetics product line designates health traits with the Dairy Wellness Profit Index (DWPS) leaders and also designates the high-ranking Wellness Trait (WTS) sires. | *See below for more information on how Clarifide Plus data is collected. |
| Immunity+ Semex | Immunity+ tests the overall strength of the immune system, so any disease that generates an immune response will be affected. This includes almost all diseases affecting commercial dairy production, including mastitis, metritis, retained placenta, displaced abomasum and ketosis. Clarifide Plus also includes the Wellness Trait Index (WTS) that weighs these six traits according to their economic importance plus incorporates the economic value for the proprietary polled trait. The WTS estimates the difference in expected lifetime profit associated with risk of disease. | It was developed at the University of Guelph, over a 20-year research program. Researchers have identified methods to test animals for the overall strength of immune response to any pathogen. Animals are tested for two separate branches of the immune system: the cell-mediated immune system, that focuses primarily on defense against viruses; and the antibody-mediated immune system, that focuses primarily on bacteria. This data has been validated through many scientific publications that have shown greater resistance to disease in commercial dairy herds, increased response to vaccination and higher quality colostrum among those animals found to have stronger overall immune systems. Research has also shown that the strength of immune response is highly heritable (30 percent) and this has been validated in results from daughters of these sires found to have significantly less disease in commercial dairy herds as well. |
| Clarifide Plus Zoetis | Clarifide Plus includes genomic predictions for wellness traits that provide direct indication of the genetic risk factors for six of the most common and costly animal health challenges on dairies: mastitis, lameness, metritis, retained placenta, displaced abomasum and ketosis. Clarifide Plus also includes the Wellness Trait Index (WTS) that weighs these six traits according to their economic importance plus incorporates the economic value for the proprietary polled trait. The WTS estimates the difference in expected lifetime profit associated with risk of disease. Clarifide Plus also includes an exclusive selection index, called the Dairy Wellness Profit Index (DWPS), developed using standard selection index theory. DWPS includes production, fertility, type, longevity and the wellness traits. By using DWPS for their animal ranking, producers utilize all economically important traits, including the wellness traits, to make more comprehensive and profitable genetic selection decisions. | Clarifide Plus wellness traits utilize relevant data, yielding the highest reliabilities available today, and are the only wellness-like traits proven in an external field study. On-farm health records were edited down to over 5 million lactation records, derived from U.S. dairies with signed permissions (mostly large commercial dairies). Cutting-edge genetic evaluation methods (single-step, using a threshold model) were applied to yield 6 to 8 percent heritability and average reliabilities of 50 percent for all six traits on young genomic-tested calves First-year results from an ongoing multiherd, three-year external field study demonstrated significant associations between direct genomic predictions for Clarifide Plus wellness traits and associated disease outcomes thereafter. Results demonstrated the risks for six common diseases were approximately two times greater in the worst 25 percent of animals genetically compared with the best 25 percent, with a range of 1.6 to 17 greater odds ratios. (References omitted but available upon request.) |