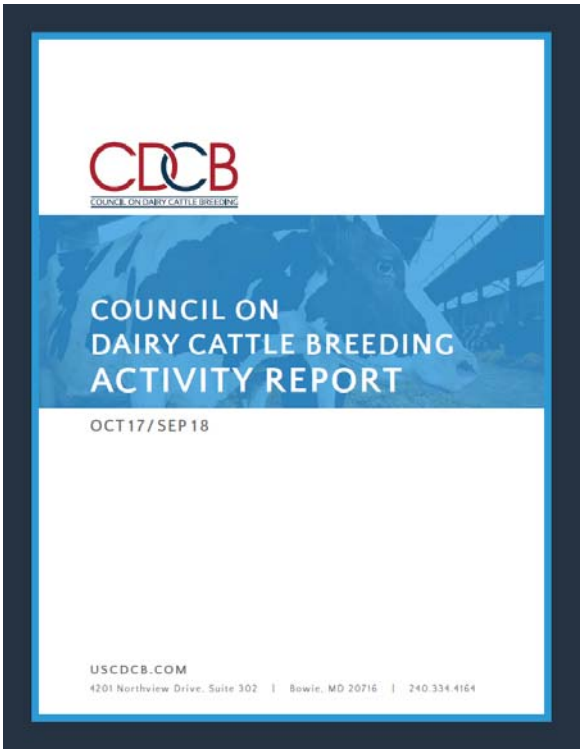
Progress. Preview. Perspective.

João Dürr, CDCB CEO

2018 Industry Meeting - Madison, WI, October 2, 2018



YEAR IN REVIEW OCT 17 / SEP 18

OCTOBER 2017

- CDCB hosted a **record crowd** of 175 attendees at 2017 **CDCB industry meeting** during World Dairy Expo in Madison, Wis.
- **New CDCB website, new query system and secure FTP went live**, providing user-friendly navigation and query capabilities.
- CDCB Genomic Laboratory **Quality Certification guidelines were implemented**, concluding development by and support of the GENLAB working group.

DECEMBER 2017

- **CDCB and USDA ARS AGIL[2] extended their collaboration** in research and data exchange through a new five-year agreement.
- The **end user agreement** defining the use of CDCB information was updated to improve clarity.
- The first **CDCB genomic nominator audit** was conducted.
- Disease resistant trait evaluations are first released (privately) to the industry collaborators in a test-run.

MARCH 2018

- Frank Ross joins the CDCB team as Web Administrator, bringing deep systems knowledge from experience at USDA ARS.

NOVEMBER 2017

- *Journal of Dairy Science* published Genome-wide association study for ketosis in US Jerseys using producer-recorded data[1].
- An **Indirect Cost Policy was approved**, setting budget standards for research projects sponsored by CDCB.

FEBRUARY 2018

- University of Wisconsin–Madison and CDCB signed a **five-year collaboration to generate residual feed intake data** from Holstein cows for future genetic evaluations.
- CDCB posted five new annual summaries based on DHI[3] records: DHI Participation, Lactation Averages by Breed, DHIA Herd Averages, DRPC[3] Activity and Somatic Cell Counts.

APRIL 2018

Three major advancements were made with the triannual genetic evaluation release:

- CDCB introduced national **genetic evaluations for disease resistance** through six new traits in Holsteins.
- **All-breed system was extended to genomic evaluations**, allowing records from animals of all breeds to be analyzed on the same scale.
- New **multi-trait Productive Life genomic model** was implemented for more accurate processing of incoming Interbull data.

MAY 2018

- The 2nd annual **Genomic Nominators and Laboratories Workshop** provided open dialogue among CDCB and 24 representatives from 13 organizations.

JULY 2018

- CDCB added the new role of Genomic Data Manager, filled by José Carrillo to enhance functionality of the genomic processing system.
- For the 3rd year, CDCB sponsored an **intern program** for future geneticists, welcoming Elif Gunal (summer 2018) and Laura Jensen (early 2019).

SEPTEMBER 2018

- Javier Buchard was selected for the new role of CDCB Innovation Director, a steward of data integrity and strategic visionary for creation of new data pipelines
- CDCB enters **Interbull validation** process for clinical mastitis

JUNE 2018

- CDCB released **two updated** DHI summaries: Reasons Cows Exit the Herd and Reproductive Status in DHI Herds.
- The **Lush Award in Animal Breeding**, sponsored by CDCB, was presented at the 2018 American Dairy Science Association® meeting to Flavio S Schenkel (right in photo above).

AUGUST 2018

- **Net Merit $ and other CDCB indexes were revised**, to incorporate disease resistance traits and update economic values.
- A new **trust fund to support AGIL research was approved**, with CDCB contributions for the next five years.
- The CDCB Board approved an **investment policy** and engaged Graystone Consulting of Columbus, Ohio, as manager.
- Members of the BSW Intergenomics consortium are added as "Approved Partners."
- The Board approved flexibilization of data exchange rules for German partner organizations, provided specific conditions are met.
- The CDCB board approved DRPC service fees for health data.

[1]Authored by Kristen Parker Gaddis and Jay Megonigal of CDCB, John Clay of Dairy Records Management System and Carl Wolfe of American Jersey Cattle Association, [2]United States Department of Agriculture, Agricultural Research Service, Animal Genomics and Improvement Laboratory, [3]Dairy Herd Information, Dairy Records Processing Center.

CDCB introduced six new health traits in April 2018. Genetic trends of disease resistance in male and female Holsteins born since 2000 are shown for each new trait in the following figures.

FIGURE 5 – Genetic trend for resistance to Displaced Abomasum for Holstein males and females born since 2000

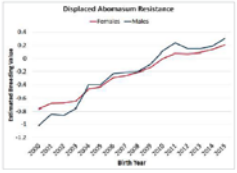


FIGURE 6 – Genetic trend for resistance to Hypocalcemia for Holstein males and females born since 2000

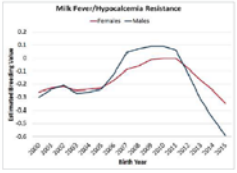


FIGURE 7 – Genetic trend for resistance to Ketosis for Holstein males and females born since 2000

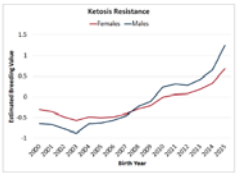


FIGURE 8 – Genetic trend for resistance to Mastitis for Holstein males and females born since 2000

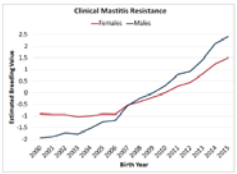


FIGURE 9 – Genetic trend for resistance to Metritis for Holstein males and females born since 2000

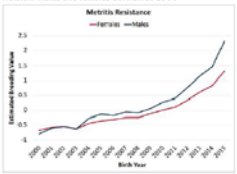


FIGURE 10 – Genetic trend for resistance to Retained Placenta for Holstein males and females born since 2000

2017-2018 for CDCB

- Extremely positive
  - Demand for services continues to increase
  - Many goals successfully achieved
  - Advances in policies and procedures
  - Objective handling of challenges

PERSPECTIVES

2019: Ten years of genomic evaluations in U.S.

The complete genome sequence of *Bos taurus* by the Bovine Genome Sequencing Consortium has been published in the April 24, 2009 issue of the journal *Science*.

2019: Ten years of genomic evaluations in U.S.

ANIMAL IMPROVEMENT PROGRAM

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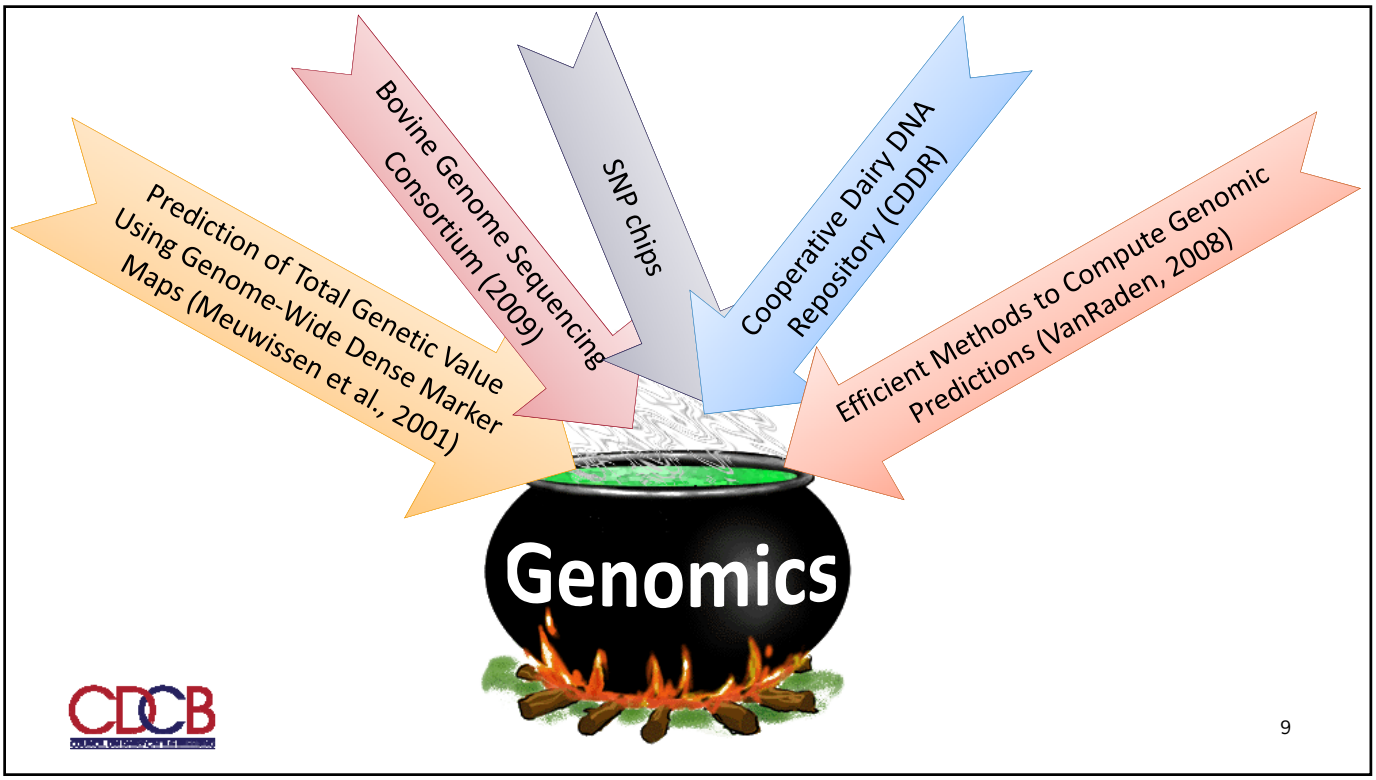
Changes to evaluation system (January 2009)

Genomic evaluations become official

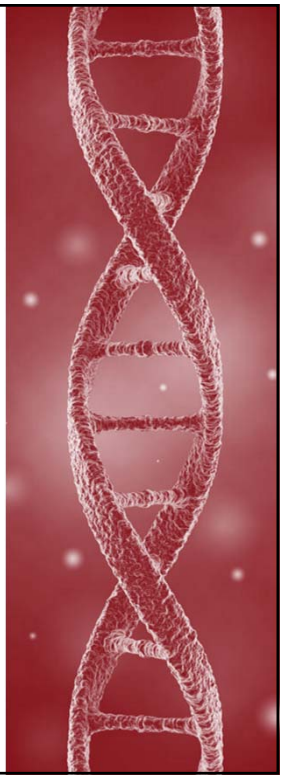
By Paul VanRaden, George Wiggans*, Tad Sonstegard†, Curt Van Tassell†, and Leigh Walton**

*Animal Improvement Programs Laboratory, †Bovine Functional Genomics Laboratory



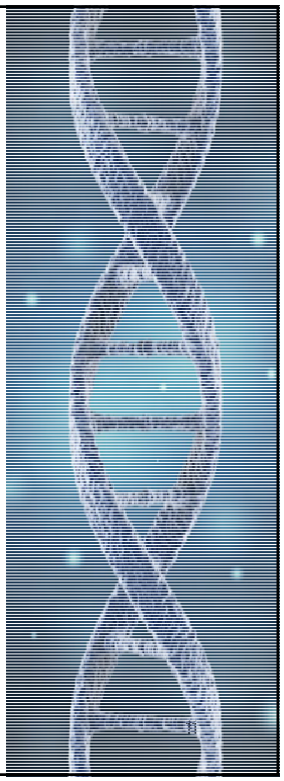
Consequences of genomic selection

- Large reference populations closely connected to predicted individuals
- Drastic reduction in generation interval
- Early genotyping vs. progeny testing schemes
- Evaluation turnaround



Consequences of genomic selection

- Consolidation and concentration
- Genotyping: new business
- Phenotypes more valuable than ever
- Nucleus herds concentrate bull dams
- Genomics as a management tool



Consequences of genomic selection

- New products:
  - Parentage verification & discovery
  - Haplotypes & recessive mutations
  - Low heritable traits
  - Traits difficult to measure

What level of involvement do dairy farmers wish to have in U.S. dairy genetics moving forward?

Would we be content with moving toward a more integrated breeding program as in poultry or swine genetics?

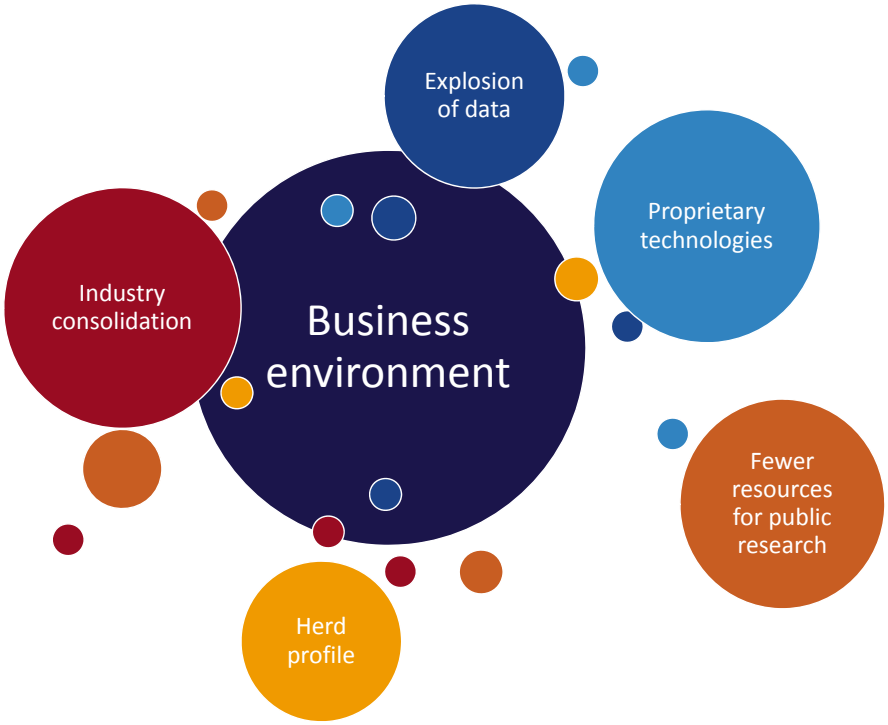
What is the value of a cooperator database with performance, management and genomic data?

How can such database support optimal decision-making in dairy herds?

How do we leverage new technologies to provide performance data and phenotypes to the cooperator database?

How can we maintain sustainable genetic progress to satisfy dairy customers and consumers?

What is the importance of independent research and genetic evaluations to provide innovation and empower dairy farmers to shape their business models?



First steps

- CDCB Innovation Director - Javier Burchard
- CDCB & Innovation Center for U.S. Dairy: business plan to foster and coordinate U.S. research and development
- Direct investments in research and the generation of feed efficiency data

2019 EVENTS: MARK YOUR CALENDARS!

CDCB will host two symposiums to honor the first decade of genomic selection and foster an open dialogue about dairy genetics for the next decade and beyond.

- **Monday**, **February 25**, with Western Dairy Management Conference in Reno, Nev.
- **Monday**, **June 24**, in association with the American Dairy Science Association and Interbull meetings in Cincinnati, Ohio