

COUNCIL ON DAIRY CATTLE BREEDING ACTIVITY REPORT

OCT 2022/SEP 2023

USDCDB.COM





ACTIVITY REPORT OCT 2022/SEP 2023

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ABOUT CDCB

The Council on Dairy Cattle Breeding (CDCB) provides premier dairy genetic information services through industry collaboration centered around a mission to help optimize cow health and productivity in herds worldwide. This non-profit organization is responsible for calculating and distributing the genetic evaluations and genomic predictions, for managing the National Cooperator Database, and for analyzing and distributing dairy cattle data in the United States. The CDCB drives continuous improvement and maintains the integrity of the world's largest animal database, building on a quality foundation with more than eight decades of recorded U.S. dairy animal performance. The CDCB is a collaboration between four sectors of the U.S. dairy industry: Dairy Records Providers (DRP), Dairy Records Processing Centers (DRPC), National Association of Animal Breeders (NAAB) and Purebred Dairy Cattle Association (PDCA).

This report was prepared for the 2023 CDCB Industry Meeting held October 4, 2023, in Madison, Wisconsin.

CDCB MISSION

TO DRIVE GLOBAL DAIRY CATTLE
IMPROVEMENT BY USING A COLLABORATIVE
DATABASE TO DELIVER STATE-OF-THE-ART
GENETIC MERIT AND PERFORMANCE
ASSESSMENTS FOR THE HERD
DECISION MAKING.

FOLLOW CDCB ALL YEAR!



<https://www.linkedin.com/company/council-on-dairy-cattle-breeding/>



<https://www.facebook.com/councilondairycattlebreeding>



<https://www.youtube.com/c/CouncilonDairyCattleBreeding>



CDCB Connection monthly newsletter

CEO COLUMN

A DECADE OF PRE-COMPETITIVE COLLABORATION



JOÃO
DÜRR

The Council on Dairy Cattle Breeding (CDCB) is celebrating a meaningful milestone in 2023, as you'll read in this report and experience during our fall events.

Ten years ago, transitioning the National Cooperator Database and genetic evaluation services of all dairy breeds from the government to the private sector was a significant undertaking. This decision was particularly significant as it occurred during the genomic revolution and involved the world's most influential dairy cattle population.

CDCB has successfully completed a decade of remarkable achievements. This is possible through the commitment of dairy producers and strong emphasis on pre-competitive collaboration among member sectors. This collaborative approach has propelled CDCB forward, has enabled us to overcome challenges, and has driven innovation in dairy cattle breeding.

The common thread in this pre-competitive collaboration is the genuine commitment to serve dairy producers as they work tirelessly to innovate, improve their herds, and responsibly produce nature's most perfect food – milk.

WHILE WE CELEBRATE THE PAST DECADE, WE WILL NOT REST ON OUR LAURELS.

CDCB and all those that serve dairy farmers must continually enhance our services and embrace new opportunities to remain relevant while change occurs at a record pace.

Moving forward, the CDCB focus is expanding our capacity and laying the groundwork to serve future needs. The contents of this annual activity report highlight CDCB's progress, priorities and integral role in the dairy business.

“Pre-competitive collaboration enables the private sector to effectively address systemic challenges by coordinating sustainability efforts, incorporating diverse perspectives, resources, and expertise, and scaling impactful solutions.”

KENNEDY, GIRARD & OLSON, 2022

These accomplishments are the result of collective efforts – the commitment of stakeholders through the Board of Directors, the dedication of our capable employees and collaborators, the unwavering support of the AGIL-USDA team, and the vital role of certified genomic nominators and genotyping labs. Most importantly, we recognize the dairy producer support of our independent system and CDCB's role to steward the national database and provide top-quality, accurate genetic evaluations and national performance metrics.

Strong foundations do not guarantee a functional long-term structure. CDCB's responsibility has multiplied as rapid change demands swift adaptation to meet the evolving needs of dairy producers and the industry that supports their farms. We have already begun modernizing CDCB's infrastructure and better understanding future needs through a producer survey, stakeholder interviews, and a well-attended, interactive workshop with database collaborators. The CDCB Board of Directors takes the received recommendations seriously and expects the CDCB staff to pursue ambitious projects that address the most impactful opportunities.

By expanding our capacity, fostering innovation, strengthening partnerships, diversifying our portfolio, securing data streams, quickly adapting to changes, improving communication, and developing talents, CDCB is positioned to lead the way and provide the dairy genetic tools required for future success. Together, we can shape a brighter future for dairy cattle breeding, sustainable practices, and increased value to farmers and all stakeholders.

CDCB FORMED BY FOUR COLLABORATING SECTORS

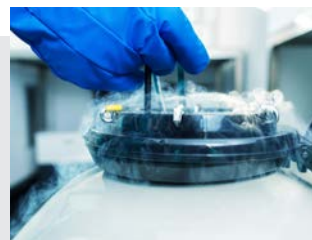


Photo by Amelior

Dairy Records Providers



Dairy Records Processing Centers



National Association of Animal Breeders



Photo by Holstein Association USA

Purebred Dairy Cattle Association

CDCB BOARD CHAIR REPORT

REFLECTING ON COMMUNICATION AND COLLABORATION



**LINDSEY
WORDEN**

This year commemorates a significant milestone –the 10-year anniversary of the non-funded cooperative agreement between USDA-ARS-AGIL and CDCB, signed March 28, 2013. This agreement initiated the transition of genetic and genomic evaluations from the government agency, AGIL to CDCB, which was completed with the December 2013 evaluations.

Fast forward to 2023: In August 2023, CDCB released updated genetic evaluations for more than 80 million dairy animals, covering 50 individual traits and four selection indexes.

Reflecting on the past 12 months, two recurring themes stand out – “communication” and “collaboration.” In a time when our world is more connected than ever, seeking collaborative opportunities beyond our own boundaries is crucial.

Several CDCB initiatives embody these themes:

- Last October, CDCB launched a revamped website, www.uscdcb.com, featuring the new WebConnect platform, replacing the legacy system for evaluation queries, results and listings, benefiting collaborators and producers.
- As part of ongoing work to update data infrastructure, CDCB has engaged iYOTAH Solutions to renovate the data ingestion system for which U.S. dairy genetic evaluations and national performance metrics are based. The two teams are working diligently on this project, and it is tracking on schedule.
- CDCB and Dairy Management Inc. are working collaboratively to identify, prioritize and enable research on genetic improvement strategies to positively impact environmental sustainability.
- At the end of August, CDCB celebrated a milestone with over eight million recorded genotypes in the National Cooperator Database! The first U.S. Holstein sires were genotyped in 2008, and in the first seven years, one million

genotypes were submitted. Since then, the database has grown exponentially with seven million genotypes added in the last eight years.

- In collaboration with Holstein Association USA and NAAB, USDA AGIL and CDCB personnel have been researching Early Onset Muscle Weakness Syndrome (HMW) in Holstein cattle. A haplotype test is in development.
- CDCB is proactively fostering communication across sectors. The inaugural National Cooperator Dairy Database Workshop, held in August in Chicago, was attended by over 100 representatives of genotyping labs and nominators, A.I organizations, DHIA and dairy record processors, and breed associations.

CDCB is in a strong financial position and is continually exploring opportunities and investments in research and service improvements to the U.S. genetic evaluation system, which helps producers and the global dairy community. Ongoing R&D projects are related to mobility and hoof health, feed efficiency and methane reduction, Johne’s disease resistance, milk yield projection factors, a new milking speed trait, and the adoption of single-step genomic methodology.

On behalf of the CDCB Board of Directors, I want to thank the CDCB staff for their dedication and commitment, the many individuals who volunteer time and expertise as members of a CDCB committee, and the hardworking dairy farmers whose contributions sustain the CDCB mission.



Photo provided by Holstein Association USA



Tremendous
thanks to Jay
WEIKER

of National Association of Animal Breeders, for his leadership as CDCB Chair from April 2021 to April 2023.

BOARD OF DIRECTORS

The CDCB Board of Directors guides the development and continuous improvement of U.S. dairy genetics and CDCB services.

Tony Allen, General Manager of AgriTech Analytics, joined the CDCB Board in April 2023 representing Dairy Records Processing Centers.

Paul Hunt, Jonathan Lamb and Susan Lee were re-elected to new three-year terms.

OFFICER TEAM

CDCB officers were elected in April 2023 and will continue in these roles through April 2025.

- **Lindsey Worden**, *Chair*
- **Dan Sheldon**, *Vice Chair*
- **Mark Rodgers**, *Secretary*
- **Jay Weiker**, *Treasurer*



2023-2024 BOARD OF DIRECTORS

Dairy Records Providers

- **Susan Lee**, *Idaho DHIA, Jerome, Idaho*
- **Jay Mattison**, *National DHIA, Verona, Wis.*
- **Dan Sheldon**, *Vice Chair, Woody Hill Farms, Salem, N.Y.*

Dairy Records Processing Centers

- **Tony Allen**, *AgriTech Analytics, Visalia, Calif.*
- **John Clay, Ph.D.**, *Dairy Records Management Systems, Raleigh, N.C.*
- **Mark Rodgers**, *Secretary, MKVT Polled Holsteins, Glover, Vt.*

National Association of Animal Breeders

- **Paul Hunt**, *URUS Group, Madison, Wis.*
- **Katie Olson, Ph.D.**, *ABS Global, DeForest, Wis.*
- **Jay Weiker**, *Treasurer, NAAAB, Madison, Wis.*

Purebred Dairy Cattle Association

- **Jonathan Lamb**, *Oakfield Corners Dairy, Oakfield, N.Y.*
- **Neal Smith**, *American Jersey Cattle Association, Reynoldsburg, Ohio*
- **Lindsey Worden**, *Chair, Holstein Association USA, Inc., Brattleboro, Vt.*

Non-Members Supporting the CDCB Board

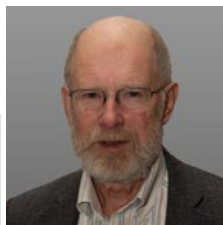
- **Paul VanRaden, Ph.D.**, *USDA AGIL Industry Liaison*
- **João Dürr, Ph.D.**, *CDCB Chief Executive Officer*

USDA AGIL = United States Department of Agriculture, Animal Genomics and Improvement Laboratory

THANK YOU to these individuals who dedicate their time, energy and expertise to genetic improvement benefiting dairy herds worldwide.



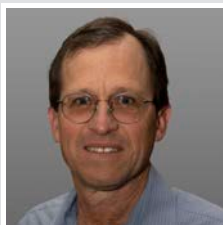
Lindsey Worden
Chair



Dan Sheldon
Vice Chair



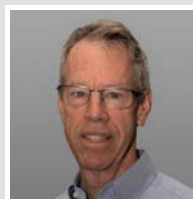
Jay Weiker
Treasurer



Mark Rodgers
Secretary



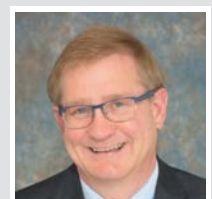
Tony Allen



John Clay



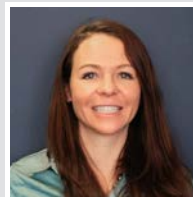
Susan Lee



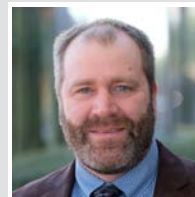
Jay Mattison



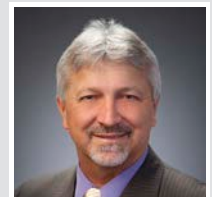
Paul Hunt



Katie Olson



Jonathan Lamb



Neal Smith



Thank you **Eddie OKMONDE**

FOR SERVICE ON CDCB BOARD

We appreciate your commitment to dairy improvement and your service to CDCB.

A DECADE OF CDCB: GENETIC ADVANCEMENT THROUGH PRE-COMPETITIVE COLLABORATION

Although the Council on Dairy Cattle Breeding was formed in 1988, its role radically transformed in 2013 with the transfer of services previously delivered by United States Department of Agriculture.

Until 2013, USDA generated and managed the U.S. dairy database, and calculated, published and distributed U.S. genetic evaluations for dairy cattle and goats. A Non-funded Cooperative Agreement (NFCA) signed on March 27, 2013, between USDA-ARS-AIPL and CDCB provided for the coordinated transition of these services.

In the 2 ½ years prior, several organizations – breed associations, A.I. companies, milk recording and dairy records processing, private entities, universities and USDA – worked together to create this new direction for the future of U.S. genetic evaluations and management benchmarks. This transition from the government to the private sector was significant – especially during the “genomic revolution” and involving the world’s most influential dairy cattle population.

Today, USDA Animal Genomics and Improvement Laboratory focuses on research. AGIL, remains an important partner to develop methodologies that advance genetic progress in dairy cattle worldwide.

10 YEARS AGO

December 2012: CDCB moved to a formal operating board and seated a 12-member Board of Directors

March 27, 2013: CDCB responsible for national dairy database and genetic evaluations after signing NFCA with USDA

March 2013: H. Duane Norman and Leigh Walton came out of retirement after successful careers at USDA to direct activities, ensure effective transition and bring historical expertise, as CDCB staffing ramped up

April 2013: CDCB delivered genetic evaluation results for production traits

November 2013: Database exceeded half-million (500,000) genotypes

December 17, 2013: Two-year “operational countdown” began for CDCB to build self-sufficiency for complete transfer

February 20, 2014: First CDCB Annual Meeting

March 2014: All official, monthly and interim genetic evaluations run by CDCB with minimal help from USDA staff

September 17, 2014: João Dürr began as CDCB Chief Executive Officer, bringing a wealth of managerial experience in milk recording, database development and genetic evaluations



Ole Meland (CDCB Chair from 2013–2014) and George Wiggans (representing USDA) at the March 2013 signing of the transition agreement



Duane Norman, João Dürr, George Wiggans and Rex Powell (USDA) in the early days of Dürr’s tenure as CEO.

CDCB Officers leading this transitional period were Ole Meland, Chair; Jay Mattison, Vice Chair; John Clay, Secretary and Neal Smith, Treasurer.

The CDCB Board, various committees, task forces and working groups provided direction and functional support. As many as 16 groups working at one time with over 75 individuals from A.I. organizations, Dairy Records Providers, Dairy Records Processing Centers and breed associations.

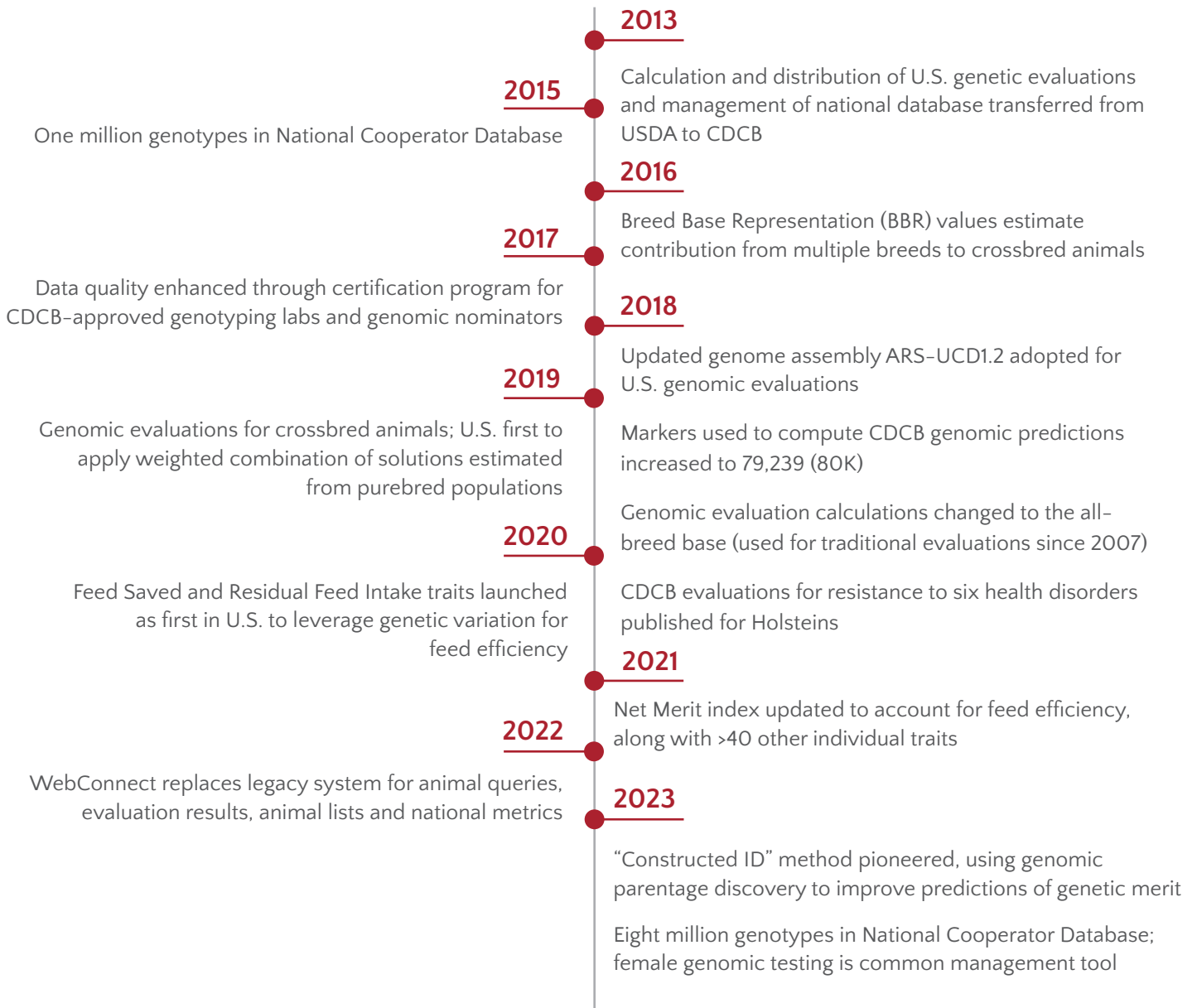
In early days, Reynoldsburg, Ohio, was the CDCB mailing address. Administrative support of American Jersey Cattle Association was valuable, including the meticulous management of CDCB accounting by AJCA’s Vickie White until 2022.



Leigh Walton and H. Duane Norman (left to right)

MILESTONES OF THE DECADE

A decade of remarkable achievements has been possible through the commitment of U.S. dairy producers and pre-competitive collaboration among the dairy industry organizations, strategic global partners and the continued ingenuity at CDCB and USDA AGIL.



Journey to 8 Million

Number of Animal Genotypes in CDCB Database

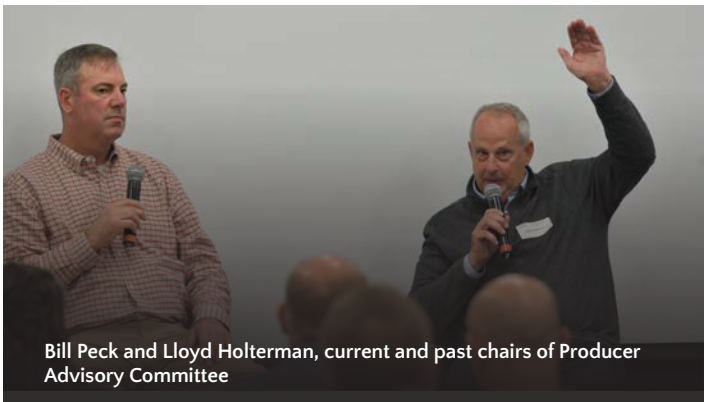
First Sires Genotyped



YEAR IN REVIEW OCT 2022 / SEPT 2023

OCTOBER 2022

- The connection of genetics and sustainability was explored during the 8th annual CDCB Industry Meeting with 150+ attendees in Madison, Wis.
- A revamped www.uscdcb.com launched, delivering more, easy-to-access info on U.S. dairy genetics. WebConnect replaced the legacy data and query system. »page 13



Bill Peck and Lloyd Holterman, current and past chairs of Producer Advisory Committee

FEBRUARY 2023

- CDCB introduced “Constructed ID’s” as a new solution using genomic discovery of ancestry to build more complete pedigrees, resulting in more accurate, reliable evaluations. »page 14
- QDisc, or quick discovery of close relatives, launched as a quick-turnaround service using ICAR-defined parentage SNP to discover close relatives.
- Taylor Marie McWhorter, 2019 CDCB intern, rejoined CDCB full-time as Geneticist.



Congratulations Andres Legarra

Andres Legarra was honored by American Dairy Science Association in June 2023 with the J.L. Lush Award in Animal Breeding. Andres (right in photo) joined CDCB as Senior Geneticist in January 2023, bringing tremendous expertise in genetic evaluation, including phenotypes, pedigree and markers.

NOVEMBER 2022

- WebConnect enhanced for convenient accessibility on smartphones and tablets.

DECEMBER 2022

- Nearly 79 million dairy animals received updated values for 50 traits and four selection indices; first triannual evaluations with all web reports and results distributed exclusively through WebConnect.
- The CDCB Board of Directors met December 14–15 in Minneapolis, approving the 2023 budget with strong research emphasis, a policy and outreach plan for Constructed ID’s and new quick parentage discovery service.
- The milestone of 7 million genotypes in database was reached on December 19, 2022.

JANUARY 2023

- Andres Legarra joined CDCB as Senior Geneticist, with vast experience in quantitative genetics and animal breeding in Spain, the U.S. and France.
- CDCB re-accredited as a DNA Data Interpretation Center for parentage verification by the International Committee for Animal Recording (ICAR).

MARCH 2023

- Katie Schmitt joined CDCB in the new position of Outreach Specialist to enhance CDCB collaborations and program implementation.
- Partnership with iYOTAH Solutions announced to renovate the data ingestion system for the National Cooperator Database. »page 13
- Dairy Management Inc. and CDCB announced Memorandum of Understanding for research collaboration that impacts environmental sustainability through use of natural genetic improvement and selective breeding. »page 16

APRIL 2023

- April 4 triannual evaluations enhanced to improve accuracy, including significant addition of health records and annual updates to SNP usability and Breed Base Representation (BBR).
- Calf recumbency (now early onset muscle weakness) genetic condition announced in joint release by Holstein Association USA, NAAB and CDCB.
- CDCB Board met April 18-19, 2023, in Louisville, Ky., with emphasis on strategic planning, the appointment of Producer Advisory Committee members, Board reorganization and the official CDCB Annual Meeting.
- Tony Allen of AgriTech Analytics joined the CDCB Board. Thanks to Eddie Ormonde of VAS for his Board service.
- Dairymen Greg Andersen and Anthony Machado appointed to Producer Advisory Committee, as Kent Buttars and Lloyd Holterman completed their three-year terms. »page 19

MAY 2023

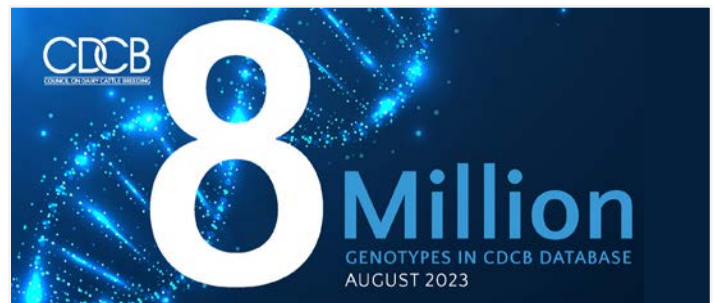
- Courtney Hoff joined CDCB as a Data Support Specialist.
- Malia (Martin) Caputo began a two-year postdoctoral appointment at CDCB.

JUNE 2023

- Jonathan Layton and Joe-Menwer Tabet are the 2023 summer interns, in the seventh year of CDCB's intern program. »page 17
- CDCB staff began a summer event tour, attending breed conventions to further develop the Dairy Breed Improvement Collaboration. »page 20
- American Dairy Science Association® honored Andres Legarra of CDCB as the 2023 recipient of the J. L. Lush Award in Animal Breeding.
- Tanji Wendorff joined CDCB as Project Manager.

JULY 2023

- CDCB announced its ninth annual CDCB Industry Meeting will move to a new venue – The Tanbark – at World Dairy Expo.



AUGUST 2023

- The 8 millionth genotype was recorded in the National Cooperator Database.
- “Constructed IDs” included in official files for triannual evaluations, as the U.S. pioneers this new way to use genomics for pedigree discovery and enhanced evaluation accuracy. »page 14
- The first National Cooperator Dairy Database Workshop was held in Chicago, with 106 representatives of all sectors that contribute data into the National Cooperator Database. »page 18
- During its August 24-25 meeting, the CDCB Board analyzed and aligned recommendations from the CDCB member-sectors with the Board's independent strategic planning process.

SEPTEMBER 2023

- Greener Cattle Initiative announced its first research grant to develop selective breeding as a tool to lower methane emissions, awarded to the University of Wisconsin, with additional support from CDCB. »page 16



Interactive round table discussions resulting in practical recommendations were prioritized at the August workshop.

CDCB PERSONNEL

The CDCB team is dedicated to delivering value to dairy producers and industry stakeholders, with work centered around three pillars.

CDCB support functions – office management, human resources, information technology, public relations, accounting and legal – are performed in-house or by external collaborators to ensure that CDCB operates as efficiently as possible.

NATIONAL COOPERATOR

DATABASE Maintaining efficient data flow protocols, ensuring data safety, optimizing data management procedures, and abiding by high data quality standards

GENETIC SERVICES Offering benchmark references, adopting advanced genomic tools, carrying out genetic evaluations, and ensuring the dairy industry receives the information they need in an efficient, timely manner.

RESEARCH & INNOVATION

Developing data pipelines using novel recording technologies and assessing unexplored data pools, developing new products and methods that benefit service users, and facilitating data access requests from the scientific community.

Lillian Bacheller, *Senior Applications Developer*
 Javier Burchard, Ph.D., *Chief Innovation Officer*
 José Carrillo, Ph.D., *Chief Data Officer*
 Maria Caputo, Ph.D., *Post-Doc*
 Robert Cooper, *Business Manager*
 João Dürr, Ph.D., *CEO*
 Cindy Ferrier, *Office Manager*
 Heather Adams Enzenauer Ph.D., *Applied Geneticist*
 Kristen Parker Gaddis, Ph.D., *Geneticist*
 Courtney Hoff, *Data Support Specialist*
 Gerald Jansen Ph.D., *Technical Advisor*
 Andres Legarra, Ph.D., *Senior Geneticist*

Jay Megonigal, *IT Manager*
 Rodrigo Mota, Ph.D., *Applied Geneticist*
 Jhamal McKee, *Junior System Administrator*
 Taylor Marie McWhorter, Ph.D., *Geneticist*
 Ezequiel Nicolazzi, Ph.D., *Chief Operation Officer*
 Frank Ross, *System Administrator*
 Duane Norman, Ph.D., *Technical Advisor & Industry Liaison*
 Katie Schmitt, *Outreach Specialist*
 Kaori Tokuhisa, *MSC, Genomic Data Analyst*
 Tanji Wendorff, *Project Manager*
 George Wiggans, Ph.D., *Technical Advisor*
 Xiao-Lin (Nick) Wu, Ph.D., *Product Development Manager*



THE CDCB TEAM

IN FEBRUARY 2023,
BOWIE, MARYLAND

FIRST ROW (L-R): Kendra Randall, Lillian Bacheller, Kristen Parker Gaddis, Taylor Marie McWhorter, Cindy Ferrier, Rodrigo Mota
SECOND ROW (L-R): Jay Megonigal, Heather Adams Enzenauer, Katie Schmitt, Duane Norman, Jhamal McKee, Lauren Thomas
THIRD ROW (L-R): Gerald Jansen, George Wiggans, José Carrillo, João Dürr, Andres Legarra, Ezequiel Nicolazzi, Frank Ross



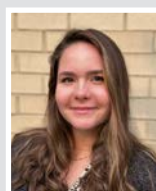
Javier Burchard



Malia Caputo



Robert Cooper



Courtney Hoff



Kaori Tokuhisa



Tanji Wendorff



Nick Wu

CDCB WORKING GROUPS

These individuals provide valuable input and ongoing collaboration in the spirit of continuous improvement.

PRODUCER ADVISORY COMMITTEE (PAC)

PURPOSE

Provide grassroots input for development of strategy, policy and activity, including future priorities and opportunities to be pursued by the CDCB.

Read more on page 19

GROUP MEMBERS

Bill Peck, (Chair), *Welcome Stock Farm, Schuylerville, N.Y.*
Greg Anderson, *Seagull-Bay Dairy, American Falls, Idaho*
Spencer Hackett, *Melarry Farms, Rice, Minn.*
Tom Kestell, *Ever-Green-View Farm, Waldo, Wis.*
Anthony Machado, *Couco Creek Dairy, Turlock, Calif.*
Sean Tollenaar, *Tollcrest Dairy, Wheatland, Calif.*

DAIRY EVALUATION REVIEW TEAM (DERT)

PURPOSE

Provide independent, objective and confidential reviews of the CDCB triannual dairy genetic evaluation results prior to the public (official) release in April, August and December. This has enabled identification of issues and improved evaluation-day data release.

GROUP MEMBERS

Sam Comstock, *Holstein Association USA*
Tom Lawlor, *Holstein Association USA*

Mehdi Sargolzaei, *Select Sires Inc.*
Ryan Starkenburg, *ABS Global, Inc.*
Bob Welper, *PEAK Genetics*

GENETIC EVALUATION METHODS (GEM)

PURPOSE

Provide independent, objective and impartial advice and strategic guidance to AGIL and CDCB staff throughout the development of dairy genetic evaluations.

GROUP MEMBERS

Christian Maltecca (Chair) *North Carolina State University*
Tom Lawlor, *Holstein Association USA*
Daniela Lourenco, *University of Georgia*
Ezequiel Nicolazzi, *CDCB*
Ryan Starkenburg, *ABS Global*

Robert Tempelman, *Michigan State University*
Paul VanRaden, *USDA AGIL*
Kent Weigel, *University of Wisconsin-Madison*

EVALUATION FREQUENCY TASK FORCE

PURPOSE

Prepare a cost-benefit analysis of increasing the frequency of full genetic evaluations and an implementation strategy (if current frequency is modified).

TASK FORCE MEMBERS

Chuck Sattler (Chair) and **Andy Stiefel**,
representing National Association of Animal Breeders
Angela Coburn and Steven Smith,
representing Dairy Records Processing Centers
Steven Sievert, *representing Dairy Records Providers*

Tom Lawlor and Neal Smith,
representing Purebred Dairy Cattle Association
Paul VanRaden, *USDA AGIL*
João Dürr and Ezequiel Nicolazzi,
CDCB

MILKING SPEED EVALUATION TASK FORCE

PURPOSE

Review the potential to implement genetic evaluations for milking speed in all dairy breeds and make recommendations to ensure data flow, data quality and publication standards.

TASK FORCE MEMBERS

Asha Miles (Chair) *USDA Animal Genomics Improvement Laboratory*,
Jeffrey Bewley, *Holstein Association USA*
João Dürr, *CDCB*
Sophie Eaglen, *National Association of Animal Breeders*

Robert Fourdraine, *Dairy Records Management Systems*
Kristen Gaddis, *CDCB*
Steven Sievert, *National Dairy Herd Information Association*

See page 15 for outcomes of the task force work.

CDCB IN NUMBERS

Genotypes

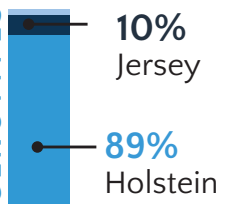
in National Cooperator Database managed by CDCB



8 million

genotypes in world's largest animal database. *(August 2023)*

GENOTYPES



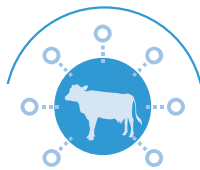
♂ **7%** of genotyped animals are male

♀ **93%** of genotyped animals are female



72 Countries with animal genotypes in CDCB database

IN 2022, CDCB DATABASE INTEGRATED >38M PHENOTYPIC RECORDS AND >1M GENOTYPES FROM DAIRY ANIMALS



80.5M animals receiving CDCB evaluations *(Aug 2023)*

♂ **711K** Male

♀ **79.8M** Female

50 traits calculated by CDCB

- **4** selection indexes
- **5** production traits
- **21** health, fertility & calving traits
- **22** conformation traits
- **26** official genetic conditions & haplotypes

Weekly genomic predictions for new genotyped animals

Monthly genomic evaluations

Triannual evaluations conventional, genomic & Interbull *(in APR, AUG & DEC)*

Total number records used in Aug 2023 evaluation

123M
Cow Livability

105M
Lactation

96M
Fertility

69M
Somatic Cell Score

39M
Calving Ease

11M
Health Traits

10K
Residual Feed Intake

Genotypes Included in Evaluations

USABLE GENOTYPES BY BREED (SEPT 2023)

- 🐄 **Ayrshire** 17,092
- 🐄 **Jersey** 749,876
- 🐄 **Brown Swiss** 72,431
- 🐄 **Holstein** 6,643,035
- 🐄 **Guernsey** 8,754
- 🐄 **Crossbred** 267,598

WebConnect Replaces Legacy Data System

In late 2022, CDCB WebConnect completely replaced the legacy system originally developed by USDA for animal queries, evaluation results animal lists and national performance metrics. December 6, 2022, evaluations were the first with all web reports and evaluation results distributed exclusively through WebConnect.

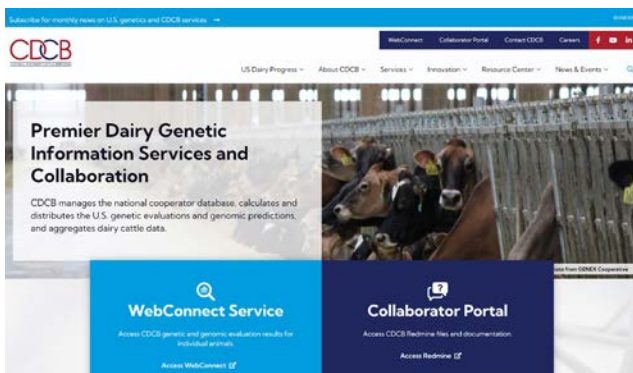
WebConnect provides more data, more customization and user-friendly formats for the animal data, queries and statistics used by dairy producers and industry cooperators. Public access is available for reports and statistics, pedigree information and evaluation results. More robust users have log-in access to specific data.

Prior to the complete transition, WebConnect ran parallel with the legacy system for six months, for user familiarity and enhanced functionality. Key in the upgrade was Mobile WebConnect, a compact version for convenient design and public access on smartphones and tablets.

For years, CDCB produced DHI annual reports to document changes based on information collected through Dairy Herd Information (DHI). With WebConnect, users have 24/7 access to calculate and view these national performance metrics and more.

CDCB's New Storefront: www.uscdcb.com

The renovated website was unveiled in October 2022, delivering more, easy-to-access info about dairy genetics and the U.S. evaluation system. Goals for the site transformation were improved user experience, more intuitive navigation, modern design and graphics, and expanded resources about U.S. genetic evaluations.



Site Features Include:

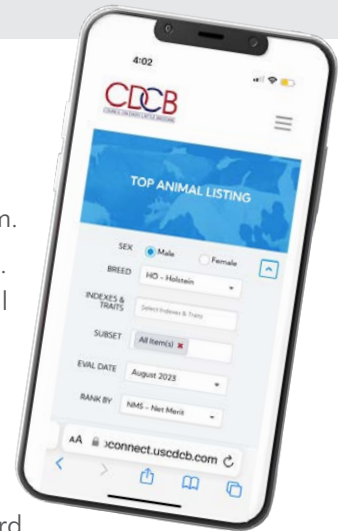
- U.S. Dairy Progress
- About CDCB
- Services
- Innovation
- Resource Center
- News & Events

Data Ingestion Platform Being Revamped

CDCB has partnered with iYOTAH to revamp CDCB's data ingestion system.

Data ingestion is the backbone of U.S. dairy genetic evaluations and national performance metrics, bringing data into the CDCB National Cooperator Database from more than 70 diverse partners. Data providers include breed associations, dairy records processing centers, Dairy Herd Information (DHI) field services, laboratories, genomic collaborators and international cooperators. In 2022, the CDCB database integrated more than one million genotypes and 38 million phenotypic (performance) records from dairy animals – with a robust quality assurance program applied for data integrity.

“As the backbone of U.S. genetic evaluations, it is imperative that our data ingestion system is modernized,” said João Dürr, CEO of CDCB. “Our existing system, with roots back to the 1970’s, has evolved and served the industry well.”



“It is time to invest in a new system with increased capabilities to better serve dairy farm and industry needs for 2025 and beyond.” JOÃO DÜRR

The new platform is being designed to enhance functionality and more efficiently manage different types of data from current and emerging data sources. Improvements will include larger storage, better data accessibility, increased responsiveness, enhanced capabilities such as Application Program Interface (API), improved user feedback at time of data exchange, and direct interaction for data partners with the National Cooperator Database.

The new platform is expected to launch in 2025. From now to then, CDCB and iYOTAH will engage with data providers around the functional needs, progress and timeline.

iYOTAH was selected to partner in this work, due to demonstrated expertise in herd-focused technology and state-of-the-art software solutions for data connectivity and exchange. iYOTAH has partnered with several organizations across dairy and livestock, including National Dairy Herd Information Association.

GENETIC EVALUATION CHANGES

DECEMBER 2022

- Resolution to ensure inclusion of all Feed Saved herds and daughters in format 38 files
- Correction to pedigree usage in non-Holstein type traditional evaluation

APRIL 2023

- Inclusion of first Constructed IDs as implementation underway
- Significant increase of records in health evaluations
- Addition of Brown Swiss Fertility Haplotype BH14
- Application of new method to test Holstein Cholesterol Deficiency (HCD) Inheritance
- Gestation Length (GL) edit for unreported embryo transfer
- New edits for Heifer Livability (HL)
- Annual SNP usability update and increase of imputation error rate
- Yearly Breed Base Representation (BBR) update
- Exclusion of Interbull Milking Shorthorn type evaluations
- Exclusion of New Zealand from pedigree and PTA of foreign dam exchange
- Inclusion of Brown Swiss foreign evaluations in U.S. Clinical Mastitis evaluations

AUGUST 2023

- First publication of Constructed IDs in official bull and cow files
- More records used for Gestation Length (GL), Cow Livability (LIV), and Heifer Livability (HLV)
- Exclusion of French PTA values for some females due to single-step model implementation
- Implementation of stricter rules to include Interbull evaluations in U.S. evaluations



Find more detail on changes at uscdcb.com

2024 TRIANNUAL EVALUATION DATES:

April 2, August 13, December 3, 2024



CONSTRUCTED IDs

CDCB and USDA AGIL are the first worldwide to implement a solution that leverages genomic parentage discovery to predict genetic merit more accurately. This new methodology – “Constructed IDs” – was applied in 2023 for more than 1 million genotyped animals.

Knowing an animal’s ancestry several generations back is certainly the breeders’ goal; however, there are instances where animals have a pedigree gap. When a sire, dam, or other ancestor is unknown, we cannot accurately factor their contributions. As animal breeders, we’ve hit a dead end.



Modern genomic tools and haplotype matching enable accurate identification of previously-unknown ancestors. The Constructed ID method leverages that discovery to complete the pedigree gaps. Genetic evaluations for affected animals are more accurate and reliable, and the U.S. genetic evaluations overall improve in accuracy.

The foundation was developed at USDA AGIL through tested, highly-accurate, peer-reviewed methodology described in Journal of Dairy Science papers (VanRaden et al, 2013 and Nani et al, 2020).

Because the U.S. system requires a specific dam identification to link in the maternal ancestors, CDCB then created Constructed Dam IDs that are unique, traceable, stable and recognizable as a placeholder.

Beginning in April 2023, Constructed ID’s were implemented, pedigree links were completed, and subsequent evaluations for affected animals were more accurate with higher reliability. In the August 2023 triannual evaluations, Constructed IDs were included in the official bull and cow files.

RESOURCES ON CONSTRUCTED IDS

Check the CDCB website library for resources

- Constructed ID’s Frequently Asked Questions
- Constructed ID’s Article
- May 2022 Interbull Proceedings: Adding and Reporting Genomically Discovered Ancestors
- February 1, 2023, Webinar Recording



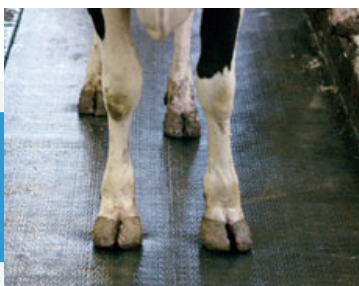
CDCB leads and supports research through a multi-faceted approach:

- Expanded in-house research capacity and expertise
- On-going collaboration with USDA AGIL
- Projects with universities and research institutions
- Support of independent research for aligned interests

We are actively exploring new and emerging traits that help farmers breed cattle that are healthy, productive, profitable and sustainable. Our goal is to identify traits that are important on dairy farms, have genetic variation, can be accurately measured, and help maintain or improve the appeal of dairy products in the marketplace.

Our priority R&D projects include mobility and hoof health, feed efficiency and methane reduction, milk yield projection factors, milking speed, Johne's disease resistance, and the adoption of single-step genomic methodology.

MOBILITY AND HOOF HEALTH



Deliverables

- Data pipeline that captures mobility and hoof health phenotypes
- Mobility and hoof health genetic evaluations
- On-farm hoof health management tools

Status

- Initial analysis of the collected CattleEye Mobility Scores and hoof health data
- Next steps include comprehensive statistical evaluation and genetic parameter analysis
- Ongoing collaboration with UMN to test the video monitoring as proactive on-farm resource

Detail on page 17 Intern Report

Collaborators

- University of Minnesota (UMN) College of Veterinary Medicine: Data pipeline
- USDA AGIL: Trait definition
- CDCB: Genetic evaluation
- Data Providers: Phenotypes
- Dairy Records Processing Centers: Phenotypes

INITIAL DATA ANALYSIS AND TRAIT DEFINITION



MILKING SPEED

Our emphasis is on connecting, creating or improving data pipelines that support interesting new traits. To develop genomic evaluations, it's critical to measure and record accurate phenotypic data for a genotyped reference population

Deliverables

- Definition of phenotypes
- Identification of data types and quality control measures
- Genomic evaluations based on quantitative data through milking systems, rather than subjective scores

Status

- CDCB Milking Speed (MS) Task Force, chaired by Asha Miles of USDA AGIL, began in October 2021 to review feasibility of U.S. genetic evaluations in all dairy breeds
- Research agreement in place between USDA AGIL and Dairy Records Management System, with 4 objectives
 1. Assemble dataset with diverse breeds, equipment manufacturers, parlor types and milking management
 2. Characterize MS for herds grouped by manufacturer/parlor type and assess impact of system effects on the phenotype
 3. Characterize biological effects on MS, especially udder health
 4. Standardize MS trait definition and estimate heritability

Detail in Hoard's Dairyman, "Is there a genetic piece to milking speed?"

Task force representation

- CDCB
- Dairy Records Management System
- Holstein Association USA
- National Association of Animal Breeders
- National Dairy Herd Information Association
- USDA AGIL

FEED EFFICIENCY AND METHANE EMISSION

Deliverables

- Increase data and enhance current feed efficiency evaluations
- Discovery and development of methane emission trait and genetic evaluations

Status

- Data collection (phenotypic and genotypic) continues in five U.S. research herds
- More herds and international data sources being explored
- Ongoing discovery and analysis to improve existing traits
- Initiated new project on enteric methane emission at University of Wisconsin–Madison

Collaborators

- CDCB
- Dairy Management Inc.
- Foundation for Food and Agriculture Research
- Greener Cattle Initiative
- Iowa State University
- Michigan State University
- University of Florida
- University of Wisconsin–Madison
- USDA AGIL

CDCB, Dairy Checkoff Collaborate in Research

Reducing dairy's carbon footprint is an important global expectation, and genetic selection is a priority solution for long-term progress. Genetic improvement ranges from increased productivity, to improved cow health, and to new traits like Feed Saved and Residual Feed Intake to select for cows that use feed more efficiently while producing the same milk yield.

In March 2023, CDCB and Dairy Management Inc. (the U.S. dairy checkoff) announced a collaboration to identify, prioritize and enable research that extends the use of natural genetic improvement and selective breeding to positively impact environmental sustainability, including by not limited to enteric methane.

CDCB, GCI Fund Research on Genetic Improvement in Methane Emissions

CDCB and Greener Cattle Initiative (GCI) announced in September 2023, funding for the University of Wisconsin–Madison to conduct research combining interventions that address selective breeding, data on milk composition and rumen microbes to reduce enteric methane emissions. The work led by Dr. Francisco Peñagaricano focuses on evaluating cattle genomes for methane traits, including those for methane production and residual methane production. The goal is to inform the selective breeding of U.S. dairy cattle with lower enteric methane emissions.

CDCB is a founding member of GCI, an industry consortium created in 2021 to support research and solutions to mitigate enteric methane in cattle.

LEARN MORE AT <https://foundationfar.org/>

MILK YIELD FACTORS



Deliverables

- Evaluate existing and new project factors
- Update or develop new milk yield projection factors and develop reliable on-farm management tools
- Compare current milk yield and component prediction methodologies

Status

- This multi-year project updates the factors created 30 years ago, to provide more accurate lactation data for the modern cow and farm management.
- Early analysis and first learnings have been presented in recent seminars and peer-reviewed journals.
- Robust study is underway to collect samples from a cross-section of U.S. herds, mainly Holstein and Jersey. Later studies will include other breeds and management systems. The comprehensive research protocol includes weekly milk samples for cows in the critical early lactation, with regular DHIA sampling after 120 days in milk. Feedstuff samples, milk yield, milk components and MIR spectral data will be collected and analyzed.

Collaborators

- CDCB
- USDA AGIL
- National Dairy Herd Information Association

LEARN MORE IN THESE PAPERS

Frontiers in Genetics: Statistical Methods Revisited for Estimating Daily Milk Yields: How Well do They Work?

JDS Communications: Daily Milk Yield Correction Factors: What Are They?

JDS Communications: Does modeling causal relationships improve the accuracy of predicting lactation milk yields?

Journal of Dairy Science: Estimating test-day milk yields by modeling proportional daily yields: Going beyond linearity.



Drs. Francisco Peñagaricano and Kent Weigel describe to the CDCB Board, the research underway at the University of Wisconsin–Arlington dairy.

CDCB INTERN PROGRAM: SUPPORTING NEXT GENERATION SCIENTISTS

For the seventh year, CDCB offered internships in 2023 to two aspiring scientists. CDCB interns have a unique opportunity to work directly with leading scientists at CDCB and USDA AGIL and conduct research in their area of interest.

ANALYSIS OF MOBILITY AND
HOOF HEALTH DATA

JONATHAN LAYTON



CDCB INTERN PROJECT

Initial data analysis of the CattleEye (CE) Mobility Scores and hoof health data collected in the CDCB-UMN project

INTRODUCTION

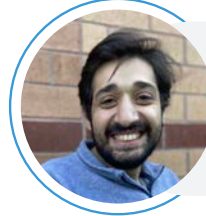
Lameness contributes to 10-15% of involuntary culling events and leads to economic losses, reduced productivity and welfare concerns. CDCB and the University of Minnesota implemented a project to investigate and develop strategies to improve mobility and hoof health.

RESULTS

Dataset analysis revealed merging challenges. Prioritizing CE mobility scores, trends, algorithm updates, and farm-specific scoring windows were discovered. The lameness scoring system consistently demonstrated stability, with only a small proportion of notably different scores within a single day, affirming its reliability. Jonathan also investigated score frequencies, revealing that most cows received a single daily score, with only a fraction having multiple scores. During data processing, Jonathan navigated over 1.1 million CE scores, ensuring retention of the most representative daily CE mobility score.

Looking ahead, CDCB will expand on this review through comprehensive statistical evaluation and genetic parameter analysis. This will include exploring various data aggregation levels, defining traits, and refining trait selection based on findings. Obtaining genetic heritability, variance components and correlations with existing traits is anticipated, ensuring a robust integration of CattleEye data as a valuable trait. Additionally, ongoing collaboration with University of Minnesota will further explore and test the potential of video monitoring as an on-farm resource to manage animal welfare and proactively prevent hoof lesions.

BIO: Jonathan Layton obtained a sustainable development degree from Appalachian State University and a MSc in animal science and quantitative genetics at North Carolina State University, researching early piglet gut microbiome factors. In summer 2022, Jonathan interned with Smithfield Premium Genetics. After CDCB, Jonathan is working for six months at the dairy genetic and herdbook center in Italy, Associazione Nazionale Allevatori della Razza Frisona, Bruna e Jersey Italia (ANAFIBJ).



CROSSBRED ANIMAL CONTRIBUTIONS
TO EVALUATIONS

JOE-MENWER TABET

CDCB INTERN PROJECT

Validate reliability estimates and investigate the information that crossbred animals contribute to dairy cattle evaluations

INTRODUCTION

This summer project aimed to evaluate the bias of reliability concerning the inclusion of crossbred daughters in the evaluation of sires.

This project arose through industry discussion about potential effects of crossbred daughters leading to an over- or under-estimation of bulls' reliability.

Four components were needed for the project:

- Predicted Transmitting Ability (PTA)
- Reliability of PTAs
- Number of phenotyped daughters
- Number of crossbred daughters

RESULTS

The number of bulls used in this study were 8,038 Holstein and 1,071 Jersey. Holstein and Jersey bulls had about 5% and 10% of crossbred daughters, respectively. A variety of models were developed to evaluate bias.

Results showed there are no big differences in the change of PTAs across breeds. Standard Deviations showed a similar pattern of variation. That could indicate the reliability is not affected since they were similar in both breeds. Heterosis was not accounted for when classifying the crossbred daughters. Holstein bulls on average had 5% of crossbred daughters as information included in the evaluation.

BIO: Joe-Menwer Tabet completed his undergraduate studies in veterinary science at the Lebanese University in Beirut, Lebanon. Afterward, he obtained an MSc in animal genetics improvement and reproductive biotechnology from the Polytechnic University of Valencia. His master's thesis project focused on leveraging Mendelian sampling to enhance genetic variability and increase genetic gain within a specific population. He is now pursuing a Ph.D. at University of Georgia, evaluating two genetically distinct populations using the single-step genomic BLUP (ssGBLUP) methodology.

CDCB outreach has risen to a new level in 2023, with the addition of Katie Schmitt in the newly-created role of Outreach Specialist. The outreach program continues to develop with five key priorities:

- 1 Position the CDCB brand as the premier genetic information source
- 2 Teach users about CDCB products and services
- 3 Obtain relevant input by creating feedback loops within CDCB for producers, stakeholders and collaborators
- 4 Stimulate synergy, engagement, loyalty and alignment with collaborators
- 5 Build trust while reinforcing the value of third-party, independent, pre-competitive evaluations and genetic services

NATIONAL COOPERATOR DAIRY DATABASE WORKSHOP

The first National Cooperator Dairy Database Workshop was hosted in Chicago, August 22-24. This event, which replaced the nominator workshop for 2023, was attended by 106 individuals who represented all collaborating sectors – Dairy Records Providers, Dairy Records Processing Centers, National Association of Animal Breeders and their members, Purebred Dairy Cattle Association members, genomic nominators and genotyping labs.

Due to the collaborative nature of the U.S. genetic evaluation system, alignment in opportunities, solutions and future direction is necessary to continue strengthening the system and delivering value to dairy producers.

Workshop participants took part in small-group exercises and large-group discussions after hearing brief sector presentations and R&D updates. At the conclusion, each sector submitted a written list of recommendations for system improvements to the CDCB Board of Directors.

These recommendations filter to six primary areas.

1. COLLABORATION AND COMMUNICATION

Improve communication with and among collaborators to ensure consistency in data conflict resolutions, establish feedback mechanisms for data conflict corrections, and maintain collaborator contact lists. Form collaborative working groups with sector representation for decision-making and develop an information-sharing portal for sectors to exchange information.

2. DATA QUALITY AND INTEGRATION

Prioritize data quality over quantity in all data streams with a focus on core traits and unique data sources rather than duplicating existing data. Maintain transparent processes for integrating new data sources and support for data collection infrastructure.

3. PRODUCER ENGAGEMENT

Enhance visibility and engagement with producers by utilizing a unified message focused on pre-competitive collaboration and the value of farms' data contributions, focusing on non-contributing and non-processed herds. Expand CDCB's value by providing accessible, user-friendly and producer-focused infographics and genetic trend information. Seek additional funding sources for data initiatives.

4. TRAINING AND RESOURCES

Conduct regular training sessions for customer service and technical users. Provide support for research needs and seek external resources when necessary.

5. TECHNOLOGY AND INFRASTRUCTURE

Innovate to develop sustainable data pipelines and accommodate new technologies. Consider automatic correction of genomic conflicts and simplification of the female testing process. Explore expanding the collaboration infrastructure with external groups for broader industry engagement.

6. TRANSPARENCY AND ROADMAP

Develop a clear roadmap with priorities and timelines of CDCB projects, involving sector input to enhance transparency in priority setting and deliverable milestones.

These recommendations have been integrated into the Board of Directors' strategic planning process. Thank you to all who participated in this workshop and reaffirmed their commitment to the collaboration that makes U.S. genetic evaluations the gold standard around the globe.









GENETIC SELECTION IS KEY TO DAIRY SUSTAINABILITY

More than 150 genetic enthusiasts attended the 8th annual CDCB Industry Meeting on October 5, 2022, in Madison, Wisconsin, exploring answers to the theme, “How do genetics impact sustainability goals?”

“Genetic selection is an important tool for us as farmers to reduce our carbon footprint,” said Marilyn Hershey, dairy producer and chair of Dairy Management Inc. “The people who buy our milk – they all have requirements. Their requirements on our practices are growing. To be proactive and put ourselves on the offense, in 2020 the Innovation Center for U.S. Dairy made a commitment to achieve carbon neutrality by 2050 across the chain – including farms, processing and packaging. This offense gives us control of the environmental narrative.”

Through improved genetics, reproduction, health, and diet, cows are more efficient than ever. “The goal of genetic gains toward sustainability was a focus in the dairy industry long before this topic became front and center in the press,” shared Bill Peck, Jr., chair of the CDCB Producer Advisory Committee. “Genetic gains have allowed for the largest factor of change for the dairy industry.”

THE AGENDA INCLUDED:

-  **Welcome**, by Jay Weiker, CDCB Chair [Recording](#)
-  **CDCB and Genetic Initiatives to Enhance Sustainability**, by Kristen Parker Gaddis, CDCB Geneticist [Recording](#)
-  **Dairy Buyer Panel: Customer and consumer expectations for sustainability** [Recording](#)
Mike Brown, Director of Dairy Supply Chain, Kroger
Brian Zook, Director of Dairy Sourcing and Sustainability, Bel Brands
-  **Role of Genetics in Sustainability and Animal Welfare**, by Marilyn Hershey, Board Chair, Dairy Management Inc [Recording](#)
-  **Producer Panel: Genetic selection and sustainability** [Recording](#)
Lloyd Holterman, Rosy-Lane Holsteins, Watertown, Wis.
Mike McCloskey, Fair Oaks Farm, Fair Oaks, Ind.
Bill Peck, Jr., Welcome Stock Farms, Schuylerville, NY
-  **USDA AGIL Research Update**, by Asha Miles, USDA AGIL Research Geneticist [Recording](#)

Read more on the 2022 CDCB Industry Meeting in [Dairy Business: Genetic Selection is Key to Dairy Sustainability](#)



Brian Zook of Bel Brands and Mike Brown of Kroger described the importance for U.S. Dairy to demonstrate its commitment to stewardship and reduce environmental impacts.

PRODUCER ADVISORY COMMITTEE

CDCB’s Producer Advisory Committee (PAC) convenes every other month to discuss current and upcoming projects, share feedback related to genetic evaluations, and bring producer concerns to CDCB.

The PAC was established in August 2019 to provide grassroots input for CDCB strategy, policy and activity, including future priorities and opportunities in genetic evaluations. Six U.S. dairy producers are appointed by the CDCB Board, each serving up to three years.

Dairymen Greg Andersen and Anthony Machado joined in April 2023, and Bill Peck of New York was re-appointed to a second year as PAC Chair.

Producers who have questions or comments about CDCB services are encouraged to reach out to PAC members or Katie Schmitt, CDCB Outreach Specialist.

Thanks to Kent Buttars and Lloyd Holterman who served on PAC from 2020 to 2023. We appreciate your commitment to ensure dairy producer interests are shared with CDCB Board and staff.

Thank you



Kent Buttars

BUTTER DELL DAIRY
Lewiston, Utah



Lloyd Holterman

ROSY-LANE HOLSTEINS
Watertown, Wis

DAIRY BREED IMPROVEMENT COLLABORATION

Adopted in 2022, the Dairy Breed Improvement Collaboration is designed to support Ayrshire, Brown Swiss, Guernsey and Milking Shorthorn breeders and their associations and societies. In summer 2023, Katie Schmitt presented the program during each breed's annual meeting.

THREE PRIORITIES OF THIS COLLABORATION:

- 1 Greater participation in programs that support breed improvement – identification, registration, type classification, dairy herd improvement (DHI), genomic testing, and NAAB cross reference. This is addressed by identifying tangible value for participation, increasing awareness and potentially incentivizing participation in different programs.
- 2 Value-driven access to CDCB genomic evaluations for bulls of smaller-population breeds. CDCB is currently subsidizing half of the A.I. Service Fee required for the use of genomic evaluations in marketing semen.*
- 3 Technical support in genetic improvement strategies. Through the Outreach Specialist, these breeds have a dedicated resource within CDCB to help optimize their selection strategies and support data movement within and from the National Cooperator Database.



MARKET RESEARCH

As CDCB updates its strategic plan, informal market research was conducted in 2023 through one-on-one interviews with CDCB collaborators and data providers, and an online producer survey.

The collaborator interviews provided input on business practices and potential future opportunities. Generally, collaborators are positive about exchanges with CDCB. While they value third-party evaluations and metrics, they are also ready for enhancements to strengthen the system. Respondents expressed opportunities for CDCB to provide more information to producers and industry personnel, while continually improving processes like data conflict resolution.

Dairy producer feedback was collected through an online survey distributed through the CDCB Connection, social media, and in-person at national breed conventions. CDCB received 79 responses from dairy producers across the U.S., who provided detail on their use of genomic testing, semen types, mating decision support, and services from Dairy Herd Information (DHI) and breed associations. The survey also assessed producer opinions on data contribution to the National Cooperator Database, genetic research priorities, new traits and value of genetic evaluations.

Katie Schmitt, CDCB Outreach Specialist, shares opportunities through the Dairy Breed Improvement Collaboration, at the 2023 American Guernsey Association Annual Meeting.



With the four breed associations, CDCB has begun building feedback loops and establishing open dialogue with producers. One-on-one and group meetings between CDCB and association staff focus on technical support required for reliable genetic evaluations and CDCB services used by breeders.

CDCB also publishes columns in breed magazines to connect breeders to CDCB resources and genetic information.

* Milking Shorthorn presently not included due to the lack of genomic evaluations.



INDUSTRY OUTREACH BY THE CDCB TEAM				
PRESENTER	TOPIC	EVENT	LOCATION	DATE
João Dürr	CDCB health evaluations	World Brown Swiss Conference	Madison, Wis.	Oct 3, 2022
João Dürr	Positioning Dairy Cattle Genetics into the Future	Plant and Animal Genome Conference	San Diego, Calif	Jan 2023
João Dürr	CDCB research collaborations	National Dairy Herd Information Association (NDHIA) Annual Meeting	Sacramento, Calif.	March 6-9, 2023
Malia Caputo	Feed efficiency and the metabolism of individual animals	National Dairy Herd Information Association (NDHIA) Annual Meeting	Sacramento, Calif.	March 6-9, 2023
Fiona Guinan	Genetic analysis of lactation consistency using daily milk weights in U.S. Holsteins	National Dairy Herd Information Association (NDHIA) Annual Meeting	Sacramento, Calif.	March 6-9, 2023
Katie Schmitt	CDCB engagement and collaboration	National Dairy Herd Information Association (NDHIA) Annual Meeting	Sacramento, Calif.	March 6-9, 2023
Katie Schmitt	Get to know CDCB	Women's Agricultural Leadership Conference	Chaska, Minn.	April 12, 2023
George Wiggans & João Dürr	Opportunities in genetics panel	Cornell University Applied Dairy Cattle Genetics course	Ithaca, N.Y.	April 14, 2023
Kristen Parker Gaddis	Genetic evaluations for mastitis and udder health	Regional National Mastitis Council	Visalia, Calif.	May 4, 2023
Duane Norman	Dairy genetics and career opportunities	Howard County Ag Science Seminar Series	Agriculture Academy, Clarksville, Md.	May 2023
Katie Schmitt	Dairy Breed Improvement Collaboration	National Brown Swiss Convention	Fresno, Calif.	June 16, 2023
Katie Schmitt	Dairy Breed Improvement Collaboration	National Milking Shorthorn Convention	Norman, Okla.	June 23, 2023
Katie Schmitt	Dairy Breed Improvement Collaboration	National Ayrshire Convention	Frederick, Md.	June 30, 2023
Katie Schmitt	Dairy Breed Improvement Collaboration	National Guernsey Convention	Lebanon, N.H.	July 9, 2023

CDCB IN THE NEWS

[CDCB asks farms to complete Milking Speed survey.](#) By Asha Miles and CDCB. *Progressive Dairy. Oct 19, 2022*

[Dairy's carbon footprint reduced by genetics.](#) By Kristen Parker Gaddis. *Hoard's Dairyman. Oct 24, 2022*

[Is there a genetic piece to milking speed?](#) By Asha Miles, USDA AGIL. *Hoard's Dairyman. Dec 1, 2022*

[What's next on the genetic selection horizon?](#) By João Dürr. *Hoard's Dairyman. Dec 5, 2022*

[How does a dairy bull get a U.S. genomic evaluation?](#) By Sophie Eaglen, NAAB. *Progressive Dairy. Jan 19, 2023*

[Constructed IDs: Eliminating Pedigree Dead Ends.](#) CDCB. *Dairy Business. March 5, 2023*

[National DHIA 58th Annual Meeting and Leadership Series.](#) By Joel Hastings. *Dairy Business. March 31, 2023*

[U.S. genetics build on dairy-driven decisions.](#) By João Dürr. *Hoard's Dairyman. April 3, 2023*

[Genetic tools have reversed cow fertility decline.](#) By Kristen Parker Gaddis. *Progressive Dairy. April 25, 2023*

[Researchers studying new defects in Holstein calves.](#) By CDCB, Holstein Association USA and National Association of Animal Breeders. *Feedstuffs. May 15, 2023*

[Better breeding programs boost sustainability.](#) By Juan Tricarico, Dairy Management Inc. *Hoard's Dairyman. May 22, 2023*

[Ensuring accuracy in the national herd.](#) By Reagan Bluel, University of Missouri. *Hoard's Dairyman. July 3, 2023*

[Data is foundational to genetic proofs.](#) By João Dürr. *Hoard's Dairyman. Aug 7, 2023*

[New proofs being new leaders.](#) *Hoard's Dairyman. Aug 11, 2023*

[Marking a decade of genetic gains with CDCB.](#) By Katie Schmitt. *Hoard's Dairyman. Sept 11, 2023*

[Cattle industry consortium funds research aimed at reducing enteric methane emissions.](#) *Dairy Business. Sept 26, 2023*

[Identifying cows that make less methane.](#) By Kent Weigel, University of Wisconsin-Madison. *Hoard's Dairyman. Sept 28, 2023*



CDCB DATA PROVIDERS

DAIRY RECORDS PROVIDERS

- AgSource
- Arizona DHIA
- Capstone Dairy Data Services
- Central Counties DHIA
- CentralStar Cooperative-DHI Services
- Dairy One Cooperative Inc.
- DHI Cooperative, Inc.
- Eastern Wisconsin DHIC
- Fresno DHIA
- Heart of America DHIA
- Idaho DHIA
- Indiana State Dairy Association
- Integrated Milk Testing Services
- Kings County DHIA
- Lancaster DHIA
- Minnesota DHIA
- Rocky Mountain DHIA
- Southern Counties DHIA
- Texas DHIA
- Tulare DHIA
- United Federation of DHIA's
- Washington State DHIA
- Willamette DHIA

CDCB-CERTIFIED GENOMIC NOMINATORS

- ABS Global, Inc.
- American Jersey Cattle Association
- Bio-Genesys Ltd.
- CRV USA
- Czech Moravian Breeders' Corporation, INC (CNBC)
- Genetic Visions-ST
- Holstein Association USA, Inc.
- Holstein Canada
- Labogena DNA
- National Association of Animal Breeders, Inc.
- Neogen Geneseek Operations
- PEAK Genetics
- SEENERGI
- Select Sires, Inc.
- Semex Alliance
- Sexing Technologies
- Synergy (Unione per i Servizi alla selezione e biodiversita)
- Weatherbys Scientific
- Zoetis

PUREBRED DAIRY CATTLE ASSOCIATION

- American Guernsey Association
- American Jersey Cattle Association
- American Milking Shorthorn Society
- Brown Swiss Cattle Breeders' Association
- Holstein Association USA, Inc.
- Red and White Dairy Cattle Association
- U.S. Ayrshire Breeders' Association

DAIRY RECORDS PROCESSING CENTERS

- AgriTech Analytics
- AgSource
- Amelicor
- Dairy Records Management Systems

CDCB-CERTIFIED GENOTYPING LABORATORIES

- Bio-Genesys Ltd.
- Czech Moravian Breeders' Corporation, Inc. (CMBC)
- Eurofins Genomics Europe Genotyping A/S (EFEG A/S)
- Genetic Visions-ST LLC
- Labogena DNA
- Neogen GeneSeek Operations
- SEENERGI
- Weatherbys Scientific
- Zoetis

INTERNATIONAL COOPERATORS

- Agriculture and Horticulture Development Board (GBR)
- ANAFI (ITA)
- BSW Intergenomics (8 countries)
- CRV B.V. (NLD)
- Eleveo ASBL (BEL)
- Lactanet (CAN)
- National Livestock Breeding Center (NLBC) (JPN)
- Nordic Cattle Genetic Evaluation (DNK, FIN, SWE)
- Interbull Centre (35 countries)
- SYNERGY (Unione per i Servizi alla Selezione e Biodiversita) (ITA)
- Qualitas (CHE) vit (DEU)

FINANCIAL REPORT

Below is a summary of the Council on Dairy Cattle Breeding (CDCB) audited financial statements for fiscal years 2022 and 2021.

During 2019, CDCB entered into an agreement with DataGene Limited for computer programming/software development, which was completed in 2022. The cost of the software is included in Property and Equipment. Depreciation expense started to be recognized in June 2022.

Effective January 1, 2022, CDCB adopted the new FASB lease accounting standard to increase transparency and comparability by recognizing lease assets and lease liabilities on the statement of financial position.

Research/Grant agreements continued in 2022 with Michigan State University, The University of Minnesota and the Foundation for Food & Agriculture Research. A new agreement was established with the University of Georgia.

Financial Statements are prepared monthly and reviewed by the CDCB Board of Directors. In addition, SnyderCohn performed a financial statement audit for the years ended December 31, 2022, and 2021. The audit report opinion states that the financial statements are presented fairly, in all material respects, and that the financial position of Council of Dairy Cattle Breeding as of December 31, 2022, and 2021, and the changes in its net assets for the years then ended are in accordance with accounting principles generally accepted in the United States of America.

2022 OPERATING REVENUE

2022 total gross revenue increased 8% compared to 2021. The largest revenue increase was generated by Basic A.I. Fees (Males).

2022 EXPENSES

2022 operating expenses increased 14% compared to 2021. Increases in contract salaries, computer equipment and services, board and staff travel, meeting expenses, advertising, and research and development attributed to the increase. In addition, depreciation expense increased significantly due to the new software being depreciated.

INVESTMENTS

CDCB's investment portfolio is managed by Morgan Stanley. The portfolio reported a loss for 2022 due to market fluctuations and unrealized losses.

2022 AND 2021 AUDITED FINANCIAL STATEMENTS

ASSETS	2022	2021
Cash	\$3,317,414	\$ 2,092,668
Investments, at fair value	6,876,485	7,762,768
Accounts Receivable	1,559,589	1,003,523
Property & Equipment (net book value)	1,344,690	1,099,347
Other	549,738	119,534
Total Assets	<u>\$ 13,647,925</u>	<u>\$ 12,077,840</u>
LIABILITIES & NET ASSETS		
Accounts payable	\$452,419	\$301,248
Long-Term Payable	25,000	50,000
Accrued Expenses	65,334	22,118
Lease Liability	507,994	0
Total Liabilities	1,050,747	373,366
Unrestricted Net Assets	12,597,178	11,704,474
Total Liabilities & Net Assets	<u>\$13,647,925</u>	<u>\$12,077,840</u>
REVENUES		
Service Fees	\$ 7,749,848	\$7,149,008
Other	13,578	3,252
Investment Income	94,687	107,272
Total Revenues	<u>\$7,858,113</u>	<u>\$7,259,532</u>
COST OF OPERATIONS		
Salaries, Service and Administration	\$ 4,735,616	\$4,448,351
Research and Development	893,494	502,760
Depreciation	355,596	63,377
Total Cost of Operations	<u>\$5,984,706</u>	<u>\$5,014,488</u>
Change in Net Assets from Operations	<u>\$1,873,407</u>	<u>\$ 2,245,044</u>
Other Income (Expense) Net realized and unrealized gain/(loss) on investments	(980,703)	335,802
Change in Net Assets	<u>\$892,704</u>	<u>\$2,580,846</u>
Net Assets, beginning	11,704,474	\$9,123,628
Net Assets, ending	<u>\$12,597,178</u>	<u>\$11,704,474</u>

CDCB VISION

To be the leading source of genetic information for dairy improvement.

CDCB CORE VALUE

Providing premier dairy genetic information services and industry collaboration.

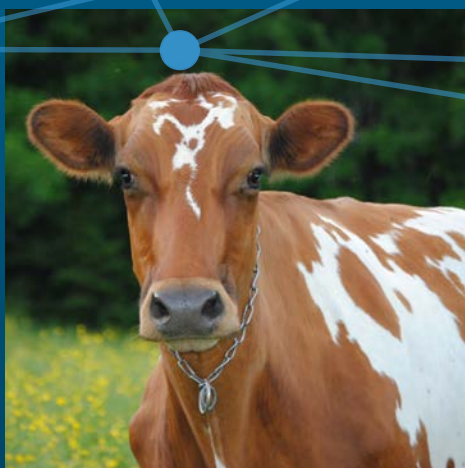
CDCB VALUES

Dairy-driven
Science-based
Cooperative

Transparent
Data-driven

CDCB MISSION

To drive global dairy cattle improvement by using a collaborative database to deliver state-of-the-art genetic merit and performance assessments for the herd decision making.



Cover photos provided by American Milking Shorthorn Association, Brown Swiss Cattle Breeders Association, GENEX, U.S. Ayrshire Breeders Association, and World Wide Sires.

USCDCB.COM

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