Quality Certification Services Inc.

Field Service Advisory Committee (FSAC) Meeting
March 8, 2016
Sheraton Lake Buena Vista Resort, Orlando, FL

Attendees
Terry Hopper, Dairy Lab Services & Chair, FSAC
Bill VerBoort, AgriTech Analytics
Tom DeMuth, AgSource Cooperative Services
Tom Blevins, Arizona DHIA
Neil Petreny, CanWest DHI
Emily Howard, Dairy Lab Services
George Cudoc, Dairy One Cooperative, Inc. & Chair, QCS Advisory Committee
Jamie Zimmerman, Dairy One Cooperative, Inc.
John Tauzel, Dairy One Cooperative
Robin Andrews, Dairy Records Management Systems
John Clay, Dairy Records Management Systems
Brian Winters, DHI Cooperative Inc.
Alfred Duran, DHIA West
Cathy Myers, DHI-Provo
Steven Smith, DHI-Provo
John Rhoads, Eastern Lab Services
Michael Gallenberger, Gallenberger Dairy Records
Dennis Drudik, Heart of America DHIA
Susan Lee, Idaho DHIA
Robert Albrecht, Indiana State Dairy Association
Emilio Chavez, Sr., Integrated DHI
Lourdes Chavez, Integrated DHI
Jere High, Lancaster DHIA
Mark Witherspoon, Mid-South Dairy Records
Bruce Dokkebakken, Minnesota DHIA
Steven Sievert, National DHIA/QCS
Jay Mattison, National DHIA/QCS
Virginia Sheridan, NorthStar Cooperative Services
Carol Decker, NorthStar Cooperative Services
Gary Holterman, NorthStar Cooperative Services
Mark Eisenga, NorthStar Cooperative Services
Chris Tucker, Rocky Mountain DHIA
Jared Means, Southeast DHIA
Dennis Marsh, Texas DHIA
Steve Frank, United DHIA
Anita Quesenberry, United DHIA
Daniel Lefebvre, Valacta

Invited Guests
John Cole, USDA-ARS-AGIL
João Dürr, Council on Dairy Cattle Breeding
Duane Norman, Council on Dairy Cattle Breeding
Joel Hastings, DairyBusiness Communications
Uffe Lauritsen, RYK (Denmark)
Reinhard Reents, VIT (Germany)
Matt Shaffer, Dairy Australia

The 2016 FSAC meeting called to order at 8:08 a.m. by Terry Hopper, Chair. Terry Hopper asked for introductions of attendees and invited guests.

The agenda was reviewed and accepted as printed.

Steven Sievert, QCS, distributed the minutes from the March 9, 2015 FSAC meeting as part of the FSAC meeting materials. It was moved, seconded, and passed to approve the minutes as printed.

Steven Sievert was appointed as recording secretary for the 2016 FSAC meeting.

Steven Sievert, Quality Certification Services, presented the following:

1. Field Service Report (attached to the minutes). There was an extended discussion of the impact of vented inflations (Milkrite impulseAir & Conewango) and the effect on accuracy of portable milk meters. There were no proposed changes to the *Auditing Procedures for Field Services*.

2. Meter Center and Technician Report (attached to the minutes). There were no proposed changes to the *Auditing Procedures for Meter Centers and Technicians*.

Steven Sievert, who also serves as Chair of the ICAR Subcommittee for Recording and Sampling Devices, provided an update of both approved and non-approved ICAR recording devices and associated samplers. Comments specific to the use of electronic milk meter monitoring reports and troubleshooting were also presented. A copy of the presentation is attached to the minutes.

Steven Sievert presented answers on commonly asked questions related to testing of AMS (Robot) herds including test plans, shuttle sampling combinations and documentation that meet the current QCS guidelines related to auditing of field services. A copy of the presentation is attached to the minutes.

Jay Mattison, President, CDCB Board of Directors, and João Dürr, CEO, CDCB provided the FSAC attendees with historical review of payments made to NAAB for certain data (RIPs, CE, Stillbirth, etc.) along with the approved renumeration for records as part of the CDCB Data Acquisition Service Fee Schedule. A copy of the presentations is attached to the minutes.

Jay Mattison, CEO, National DHIA/Quality Certification Services provided a frontline update on animal identification challenges facing DHI and the industry in general. Mattison also identified key research and innovation areas where the DHI industry needs to be engaged moving forward. These areas include AMS challenges, expansion of milk analysis using MIR, and recording and sampling device design/use.

The FSAC welcomed Dr. Steward Bauck, GeneSeek to provide an update on developments in genomic testing and Igenity products from Neogen.

Nathan Dewsbury, ThermoFisher Scientific, provided an update milk testing options for Johne's disease, BVD, Mastitis pathogens and *Salmonella dublin.*

João Dürr, CEO, and Duane Norman, Technical Advisor, from CDCB provided an operations and program update on CDCB activities.

The FSAC welcomed Dr. Reinhard Reents, VIT and Chair, Interbull Steering Committee, to provide a report on Interbull operations and an overview of dairy record processing in Germany by VIT.

Dr. John Cole, AGIL, provided the group with an update on 2016 objectives from AIP and current staffing and a summary of recent research efforts by AGIL.

Joel Hastings, DairyBusiness Communications, introduced the National DHIA mobile app under development. A spring/summer launch is anticipated on both Android and iOS platforms.

Stan Erwine, Dairy Management Inc. was welcomed by the group and provided a workshop on the need for improving our communications within our industry and externally with consumers.

Cheryl Marti, M.S., Zoetis shared the latest launch of the Clarifide Plus genomic test product from Zoetis.

The FSAC welcomed Matt Shaffer, Dairy Australia, on the industry wide approach in Australia engaging multiple organizations in the dairy industry for development of dairy herd management and education tools to maximize profit.

The FSAC meeting adjourned at 4:52 p.m.

Respectfully recorded,

Steven Sievert
QC Program Manager/Field Service and Meter Center Auditor
Quality Certification Services Inc.

Quality Certification Services Inc.

Field Service Advisory Committee (FSAC) Meeting

Tuesday, March 8, 2016
Sheraton Lake Buena Vista Resort
Orlando, FL

Meeting Room – To Be Determined
8:00 a.m. – 4:30 p.m.

The FSAC Meeting and Lunch is a Closed Event
Field Service Management, DRPC Management, and Invited Guests Only Please

8:00 a.m.	Call to Order – *Terry Hopper (Dairy Lab Services), Chair, FSAC*
	Introductions
	Agenda Review and Additions
	Approval of Minutes from 2015 FSAC Meeting (attached)
8:30 a.m.	QCS Field Service Program Update – *Steven Sievert (QCS)*
	QCS Meter Center & Technician Program Update – *Steven Sievert*
9:00 a.m.	Recording and Sampling Devices Update – *Steven Sievert*
	AMS (Robot) Herds – *Steven Sievert*
	• Test Plans and Supervision Codes • Approved Sampling Shuttle Combinations • What Documentation Meets QCS Guidelines
10:00 a.m.	Health Break
10:30 a.m.	CDCB Data Acquisition – What's Happening? – *Jay Mattison, President, CDCB/João Dürr, CEO, CDCB*
	Keeping You on the Frontline – Animal ID – *Jay Mattison, National DHIA*
11:20 a.m.	New Developments in Genomic Testing – *Stewart Bauck, GeneSeek*
11:50 a.m.	Proposed Changes to Auditing Guidelines – *Terry Hopper & Steven Sievert*
12:00-1:00 p.m.	Lunch

12:00-1:00 p.m.	Lunch
1:00 p.m.	Council on Dairy Cattle Breeding Update – *João Dürr, CEO & Duane Norman, Technical Advisor, CDCB*
1:30 p.m.	Interbull Update & VIT Database – *Reinhard Reents, VIT, Germany*
2:00 p.m.	AGIL Update – *John Cole, Acting Research Leader, AGIL* • AGIL Research Update • Net Merit Health Index
2:30 p.m.	Health Break
3:00 p.m.	The Need for Improved Communications – *Stan Erwine*
3:30 p.m.	New Developments in Genomic Testing – *Cheryl Marti, Zoetis*
4:00 p.m.	A Look Down Under – *Matt Schafer, Program Manager, Genetics & Data Management, Dairy Australia*
4:30 p.m.	Adjourn/Close Meeting

Quality Certification Services Inc.

Field Service Advisory Committee (FSAC) Meeting
March 9, 2015
Hyatt Regency, Columbus, OH

Attendees
Terry Hopper, Dairy Lab Services & Chair, FSAC
Bill VerBoort, AgriTech Analytics
Daniel Aguiar, DHIA West
David Bigelow, Sr., Lancaster DHIA
Tom Blevins, Arizona DHIA
Bruce Dokkebakken, Minnesota DHIA
Brian Winters, DHI Cooperative Inc.
Alfred Duran, DHIA West
Daniel Lefebvre, Valacta
Tony Nunes, Tulare DHIA
Kathy Sackman, Washington State DHIA
Alfred Duran, DHIA West
Dennis Edlund, San Joaquin DHIA
Emily Howard, Dairy Lab Services
George Cudoc, Dairy One Cooperative, Inc. & Chair, QCS Advisory Committee
Jamie Zimmerman, Dairy One Cooperative, Inc.
Jere High, Lancaster DHIA
Tim Pye, DHI Cooperative Inc.
Virginia Sheridan, NorthStar Cooperative Services
John Tauzel, Dairy One Cooperative
Mark Eisenga, NorthStar Cooperative Services
Chris Tucker, Rocky Mountain DHIA
Steve Frank, United DHIA
Anita Quesenberry, United DHIA
Susan Lee, Idaho DHIA
Muril Niebuhr, Minnesota DHIA
Tom DeMuth, AgSource Cooperative Services
Neil Petreny, CanWest DHI
Cathy Myers, DHI-Provo
Dennis Marsh, Texas DHIA
Steven Smith, DHI-Provo
Greg Palas, Dairy Records Management Systems
John Clay, Dairy Records Management Systems
Steven Sievert, National DHIA/QCS
Jay Mattison, National DHIA/QCS

Invited Guests
Martin Burke, CE, ICAR (Ireland)
John Cole, USDA-ARS-AGIL
Duane Norman, CDCB
Uffe Lauritsen, RYK (Denmark)
Roman Kwasiborski, FOSS

The 2015 FSAC meeting called to order at 8:00 a.m. by Terry Hopper, Chair. Terry Hopper asked for introductions of attendees and invited guests.

The agenda was reviewed and accepted as printed.

Steven Sievert, QCS, distributed the minutes from the March 10, 2014 FSAC meeting. It was moved, seconded, and passed to approve the minutes as printed.

Steven Sievert was appointed to take minutes for the 2015 meeting.

Steven Sievert, Quality Certification Services, presented the following:

1. Field Service Report (attached to the minutes). Discussion regarding field service manager continuing education was held and the auditor was directed to draft potential language for consideration as an addition to the *Auditing Procedures for Field Services*. The proposed guideline will be reviewed and discussed later during the FSAC meeting after time for review.

2. Meter Center and Technician Report (attached to the minutes). The auditor or field service/meter center managers did not propose any changes to the audit guidelines for meter centers or meter technicians.

Steven Sievert led an open discussion related to data collection and transfer concerns. Three specific items requiring investigation or action were discussion.

1. Handling of multi-day milk yields from cows less than 14 DIM: Multiple managers have expressed concern that these 5d, 7d, or 10d yield averages underestimate actual cow production and negatively affect the lactation totals. After discussion on possible options, it was agreed that any data handling or estimations should be uniform at all DRPCs. Further, it was agreed that data edits or handling should be at the DRPC level as opposed to the field service level. This item was referred to the DRPC Advisory Committee for additional research of appropriate procedures and parameters to be considered.

2. As follow-up to the 2014 FSAC meeting, Steven Sievert reviewed the supervision codes and the inclusion of a specific supervision code (“4”) for AMS (robotic) herds.

3. It was proposed that AMS herds should have their own test plan designations. The FSAC attendees directed Steven Sievert to develop a proposal for three test plan codes (Supervised AMS with Sampling, Supervised AMS – MO, and Supervised DHIR AMS. This proposal will be reviewed at the April 2015 DPRC Advisory Committee Meeting and implemented using the steps used for the last revision in National DHIA Test Plan Types.

Steven Sievert, who also serves on the ICAR Subcommittee for Recording Devices, provided an update of both approved and non-approved ICAR recording devices and associated samplers. Comments specific to the use of electronic milk meter monitoring reports and troubleshooting were also presented.

Martin Burke from Ireland was welcomed as the new Chief Executive of ICAR and Service-ICAR. Martin presented an update on ICAR activities including the actions of Subcommittees and Working Groups.

Bill VerBoort, AgriTech Analytics and DRPC Advisory Committee Chair provided a report of the activities of the committee during the past year. Bill also shared an overview of the DRPC auditing procedures and processes to the FSAC attendees.

Bill VerBoort presented his thoughts related to potential opportunities in data collection and the potential role of DHI field services and the DRPCs.

To meet the training needs of the new field technicians as well as personnel in the laboratory sectors, Steven Sievert provided an update on the planned development of training modules by National DHIA. There appears to be overwhelming support for the project.

Terry Hopper and Steven Sievert reviewed the process for changes to the auditing guidelines. There were no changes in the *Auditing Procedures for Meter Centers and Technicians* brought from the floor. Steven Sievert presented draft language for addition (insertion into document after page 5) to the *Auditing Procedure for Field Services* related to guidelines for 'Continuing Education for Field Service Managers.' After discussion, it was moved, seconded, and passed to forward this recommended addition to the Audit Review Committee for action. It is anticipated that this would become effective on January 1, 2016.

Auditing of the Continuing Education of Field Service Managers

Continuing Education Responsibility
Field service managers must complete additional training annually.

Training Format
Continuing education should be in the format that best utilizes the resources available and meets the job requirements of the field service managers.

Documentation
Documentation of the continuing education provided to each field service manager must be furnished during an audit.

This documentation must include:

- the name of each field service manager;
- a description of the training session, course, or meeting completed; and
- a list of the topics covered during the training event(s).

Verification of Documentation
Individual training records may be reviewed or interviews held with field service managers to evaluate the continuing education completed by field service managers.

Terry Hopper was elected by unanimous acclamation to another two-year term as the Chair of the Field Service Advisory Committee.

John Clay, CDCB Board, and Duane Norman, CDCB Interim Director, presented an updated on CDCB activities to attendees related to overall CDCB role and specific data activities.

John Rhoads, Laboratory Advisory Committee (LAC) Chair, provided a summary of the 2014 LAC activities and changes to the *Auditing Procedures for Laboratories* that includes a new protocol for the approval of new instruments/analyzers placed into service at existing laboratories. John Rhoads also commented on discussions related to investigating the appropriate tolerances and calibration range for the MUN portion of the samples unknown program.

As an invited presentation, Roman Kwasiborski from FOSS provided an update the status of FOSS instruments that will be no longer available for service contracts or will be in the near future. Additional topics shared included the new technologies available in milk analysis.

Jay Mattison highlighted frontline topics facing the DHI providers with discussion on:

1. Release and use of data and timeline for revisions
2. Identification
    a. Animal ID

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   b. Sample ID
   c. Sample to animal ID linkage
3. Collection of health trait data with additional comments by John Cole, USDA-ARS-AIGL
4. Tools and resources needed for the future

An update on the collection of health trait data in Canada was provided by Neil Petreny from CanWest DHI. Neil highlighted the process, partners and engagement needed for success.

Daniel Lefebvre, Valacta, shared information from their use of the BOHB for ketosis screening of milk samples including successes and limitations.

FSAC meeting adjourned at 4:24 p.m.

Respectfully recorded,

Steven Sievert
QC Program Manager/Field Service and Meter Center Auditor
Quality Certification Services Inc.

Field Service Update

Steven Sievert
Manager, Quality Certification Services, Inc.
Technical Director, National DHIA

Components of Field Service Certification

- Certified Field Service Affiliate
  - Mandatory Annual Audit
  - Compliance with Code of Ethics & Uniform Operating Procedures
  - Compliance with General and Field Service Auditing Guidelines
  - Payment of Fees

Observations – General Housekeeping

- QCS FTP site makes submission of documentation easy
  - Upload all files – Excel, PowerPoint, PDF, Access
  - Two way street – QCS can upload reports, field training presentations, other supporting documentation
- On-site audits continue to be more efficient
  - Presence of auditor increases ‘urgency’ to complete audit
  - Higher percentage of on-time submissions
  - Less follow-up materials and quicker turn around
  - Auditor can offer other support – Field Technician Training, Board Meetings, etc.
- Don’t forget backups!
  - Common Issues
    - Computer issues
    - Lost forms/documentation that was never filed or scanned in
    - Personnel changes

Observations – Initial Training of Field Technicians

- Most field service affiliates meet the minimum
- Training documentation is dated for many organizations
  - No updates to training programs since 2000-2003
  - Failure to complete follow-up training as outlined in guidelines
  - We need to provide the tools for new technicians to succeed
  - QCS recognizes variances between affiliates – just document what training you provided
- What support is needed?
  - On-line training modules?
  - Customizable/fillable templates?
  - Other?

Continuing Education for Managers

- **Certain field service affiliate managers do not attend any organized training meetings**
- **Change in Guidelines for Continuing Education of Field Service Managers effective January 1, 2016 – will report next year on compliance during 2016**
- **Increases challenges and increases costs of support**
  - **Not aware of industry changes (UOP, test plans, calibration procedures)**
  - **Have higher non-compliance issues during field service and meter center audits**

Portable Meter Calibration Performance in 2015

Meters need to be calibrated at least once every 12 months

	Best Service Provider	Poorest Service Provider	2014 Weighted Mean	2014 Weighted Mean
Not Calibrated	0%	27.9%	0.6%	0.5%
% <365 days	100% *	0%	33.7%	50.2%
% 365-425 days	0%	0%	51.5%	40.4%
>425 days	0%	100%	14.2%	9.4%

** There were 2 field service providers with 100% >365d in 2015*

Observations – Electronic Meter Reporting

- **Guidelines required that herds using in-place electronic meters need to have them calibrated at least once every 12 months**
- **Guidelines offer three options for compliance**
  - **Water Test Calibration**
  - **Parlor Report/EMMR/Manufacturer's Software Report demonstrating that meters are accurately weighing milk**
  - **Other procedure approved by the auditor**
- **Growing number of dairy-owned meters used for DHI**
  - **+ 4.1% herds, 10.2% meters when comparing 2015 to 2014**

Observations – Electronic Meter Reporting

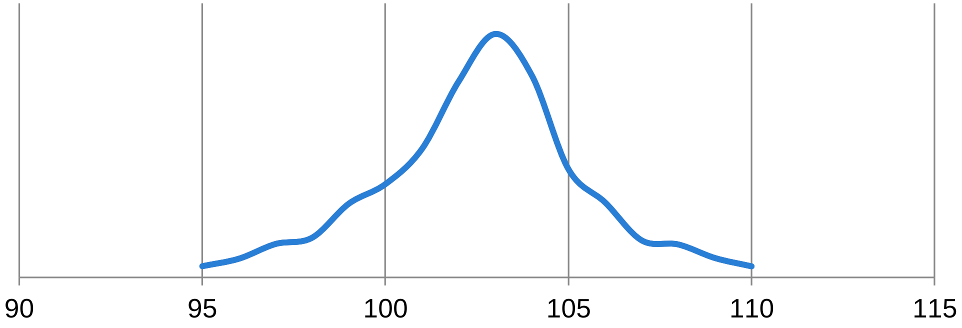
- Required for all herds
  - All test plans are included – even 40’s and 70’s
  - Data is used for genetic and management research

- Don’t forget to update make, model and number of meters as parlors expand or are remodeled

- Myths about electronic meters
  - Meters will always be in calibration
  - A 10-day average takes care of all individual cow errors

What is the Normal TD/MS Deviation?

- **Average = 102.8%**
- **Standard Deviation = 7%**
- **Acceptable Range = 96% to 110%**



Follow-up is required when:

- **TD/MS = 0 (milk shipped not reported)**
- **TD/MS <96%**
- **TD/MS >110%**

Test Day/Milk Shipped Deviations = Zero

Supervised Herds

- ✓ New herd?
- ✓ Field tech fails to report?
- ✓ Not entered or uploaded?
- ✓ Owner fails to provide milk shipped totals?
- ✓ Field tech is afraid to ask for milk shipped?

Unsupervised Herds

- ✓ Instructions to owner?
- ✓ Not uploaded on direct herds?
- ✓ Owner does not see value in reporting?

There is a misconception that 'owner-sampler' data is not used by CDCB – this is FALSE!

Test Day/Milk Shipped Deviations < 96%

Test-Day Events	Data Entry
✓ Use of milk for calf feeding?	✓ Incorrect reporting of milk sold/shipped?
✓ Correct accounting for treated milk?	✓ Correct milking times?
✓ All hospital cows in tank?	✓ Correct milking frequency?
✓ Multiple pickups or direct to tanker shipping?	✓ Drying cows off on test day?
✓ Vacuum issues leading to incomplete milk out?	✓ Multiple herd codes going into one bulk tank?
✓ Meter function?	

Test Day/Milk Shipped Deviations < 96%

Are meters reading yields accurately?

- ✓ Older Standard Bore Tru-Test meters & Waikato meters accurately proportion milk at flow rates up to 24 lbs/minute
- ✓ May be underestimating milk yield during peak flow rates – possibly 3-5% of total milk yield
- ✓ Need to use the right equipment for the job
    - ✓ Wide Bore (WB) meters accurately proportion milk at flow rates up to 32 lbs/minute

Test Day/Milk Shipped Deviations < 96%

Does the milking cluster have an effect?

- ✓ Reports of challenges with FloStar claws
- ✓ Claw is designed to encourage milk pooling and empties in a ‘sump pump’ fashion
- ✓ There is a not a steady milk flow to portable volumetric meters
- ✓ DHI meters read about 3-5% lower than on-farm fill-and-dump meters (Perfection) on total milk yield.

Test Day/Milk Shipped Deviations >110%

Test-Day Events	Data Entry
✓ Extended milking interval?	✓ Incorrect reporting of milk sold/shipped?
✓ Intentional manipulation?	✓ Correct milking times?
✓ Machine stripping?	✓ Correct milking frequency?
✓ Meter function and/or installation?	
✓ Meter reading errors?	
✓ Multiple pickups or direct to tanker shipping?	

Test Day/Milk Shipped Deviations < 110%

Are meters reading yields accurately?

- ✓ Use of Milkrite 'impulseAir' or Conewango vented inflations
- ✓ Changes the milk-air ratio in the cluster/milk line – exceeds the ISO standard for air flow
- ✓ Tru-Test meters (and all ICAR certified meters) are tested and approved to operate within ISO tolerances for air flow
- ✓ Tru-Test WB meters will read 6-10% high (usually around 7-8%)

Observations – Member/Service Agreements

- Required for all herds
  - All test plans are included – even 40’s and 70’s
  - Data is used for genetic and management research

- Good business practice, even for non-processed herds
  - Herds may convert from non-processed to processed
  - Record of herd code assignment
  - Release and use of data

- About 7% of New or Restarted Herds Missing Agreement
  - Common Issues
    - Never obtained agreement for new herd that subsequently quit
    - Missing signature(s)
    - Herd restarts DHI but member agreement is missing
    - Forget transferred herds

Meter Center and Technician Update

Steven Sievert
Manager, Quality Certification Services, Inc.
Technical Director, National DHIA

Auditing Guidelines for Meter Centers & Technicians

- **Certification for meter centers is procedure specific**
  - **Standard Flow Test Method**
  - **Fast Flow Test Method**
  - **Dual Meter Test Method**
  - **Weight Test Method (Portable Scales)**
- **Certification for meter technicians is model specific**

Service Provider Responsibilities

- To notify the auditor of changes in ownership, location address, billing address, list of customers and/or affiliates, equipment or meter technicians within 30 days.

- To pay the fees charged by the auditing organization prior to issuance of certification. For those providers certified biennially but billed in annual installments, certification will be issued on an annual basis with a renewal on receipt of the second installment payment.

Audit Definitions

Mandatory

- Regularly scheduled audit conducted during the centering month

Discretionary

- Deemed necessary by either the auditor or provider when…
  - Changes in facilities, equipment, or staffing have occurred,
  - Certain aspects of the provider’s performance are out of compliance with CDCB guidelines and/or the UOP,
  - Provider wishes to attain full certification from a conditional status,
  - Provider wishes to regain full certification from a provisional status, or
  - Provider wishes to regain provisional certification from a decertified status.

Discretionary Audits

What changes in facilities or equipment triggers a discretionary audit?

- New location for meter center
- Reconstruction or redesign of meter center
- New meter technician(s)
- New procedure(s)
- New calibration wand (if moving from closed jar-to-jar system)
- Change in vacuum pump/source
- Change in receiving jar/vessel

Meter centers are responsible for all costs with discretionary audits.

Standard Flow Calibration Wand

- QCS and Waikato worked together on development of a stainless steel 'standard-flow' calibration wand
- Works with Tru-Test pail and existing mounting brackets
- Includes restrictor, air admission orifice
- For all standard flow and dual-meter calibration procedures
- May be used for Tru-Test, FOSS and Waikato meters
- Requirement was effective on January 1, 2012
- Available from Waikato Milking Systems USA

  Part number 81380021

  $110.80 plus shipping

Changes in Auditing Guidelines

- No proposed changes in guidelines
- No new ICAR-approved portable meters to add to list of approved models
- Still significant number of older Tru-Test standard bore (yellow) & FOSS Milko-Scope meters in service

Certified Portable (Monthly) Meters – 2015 *

Model	Model	2012	2013	2014	2015
FOSS	Milko-Scope	108	96	31	31
Tru-Test	Auto Sampler (SB & WB Models)	20,141	18,518	17,558	16,884
Tru-Test	Economy (SB)	1,947	1,881	1,742	1,313
Tru-Test	Electronic Milk Meter	893	426	405	450
Tru-Test	Ezi-Test (SB & WB Models)	8,101	8,418	8,624	8,917
Tru-Test	Farmer (SB)	4,229	3,918	3,278	2,993
Tru-Test	Pullout (SB & WB Models)	43,947	41,902	39,873	39,105
Waikato	MK V (includes farmer-owned)	8,012	8,916	8,745	8,846
Waikato	SpeedSampler	208	186	179	168
Total		87,586	84,261	80,435	78,707

*not for distribution

General Observations from Meter Centers

- **Unapproved meter modification**
  - **Modification of parts so the meter samples faster resulting in inaccurate samples**
    - **Removal of ball in valve of the Tru-Test Ezi-Test meter**
    - **Cutting the tap of the Waikato MK V meter**
    - **Modification of the sampler in the Tru-Test Auto Sampler meter**

General Observations from Meter Centers

- **Unapproved meter modification**
  - **Trying to repair cracked bodies or caps with glues/cement**
    - **Weakens the whole meter**
    - **Introduces air leaks**
    - **Not approved for Grade A dairies (PMO/FDA)**

General Observations from Meter Centers

- **Unapproved meter modification**
  - **Trying to repair broken hose nipples on bodies or caps**
    - **Brass hose connectors**
    - **Ballpoint pens**
    - **Not approved for Grade A dairies (PMO/FDA)**

General Observations from Meter Centers

- **Equipment is aged beyond useful life in many meter centers**
  - **Vacuum pumps/gauges are failing**
    - **8 in 2013, 2 in 2014, 3 in 2015**
  - **Receiver jars with air leaks, buildup**
    - **5 in 2014, 5 in 2015, 2 in 2016**

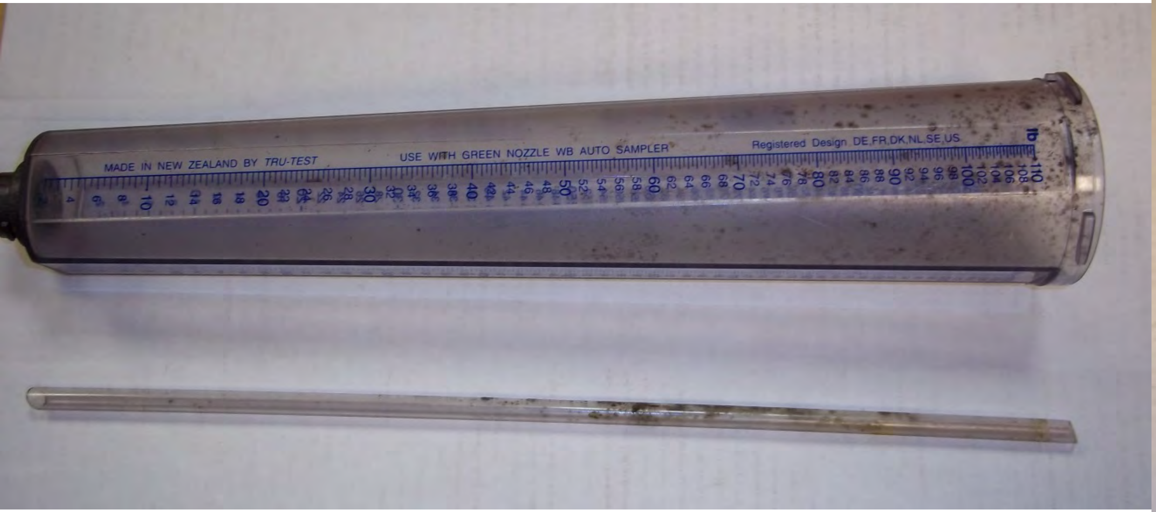
General Observations from Meter Centers

- **Platform scales for initial water verification are failing**
  - **Limited lifetime**
  - **Usually one of four load cells fails leading to scale being off by a percentage**
  - **Limited options under $200**

Observations – Portable Meter Calibration

- Many affiliates calibrate more often
  - QCS can handle multiple calibration dates
  - Use the latest two dates for the interval
- Helpful hints
  - Don’t forget to record meter center and technician
  - Don’t forget second calibration checks when required
  - No alphanumeric numbers if possible
    - 16A one year and 16-A next year creates need for manual edits
  - Use the manufacturer’s serial number for QCS reporting whenever possible

Dirty Meters Brought to Meter Center Audits



- **Need to focus on meter cleaning and sanitization with field technicians**
- **How can QCS help?**

Meter Calibration Tag Options

Guidelines require tag with meter center name along with month and year of calibration

American Weigh Scales – H & PK Series

- Digital scale with low purchase price
- 66 lb. and 110 lb. models available
- Easy to carry in computer bag
- Accurate but not legal for trade
- Can be easily calibrated
- Modern image for DHI providing accurate results

Keeping Flasks Looking Great

- Remove cloudiness from aged flasks
- Makes washing/cleanup easier
- Safe for polysulfone plastic products

Keeping Flasks Looking Great

Meter Technician Training School - 2015

Southeast DHIA

Gainesville, Florida

Meter Technician Training Schools - 2016

- Queretaro, Mexico (taught in Spanish) in conjunction with the December 2016 regularly scheduled on-site meter center audit.

- Dalhart, TX (Circle H Headquarters, LLC) with focus on Tru-Test Auto Samplers only.

Resources Available Online

QCS website is your source…

- Current auditing guidelines
- List of certified meter centers
- List of certified meter technicians
- List of approved meters and scales
- Links to manufacturers

www.quality-certification.com

Recording & Sampling Device Update

Steven Sievert
Manager, Quality Certification Services, Inc.
Technical Director, National DHIA

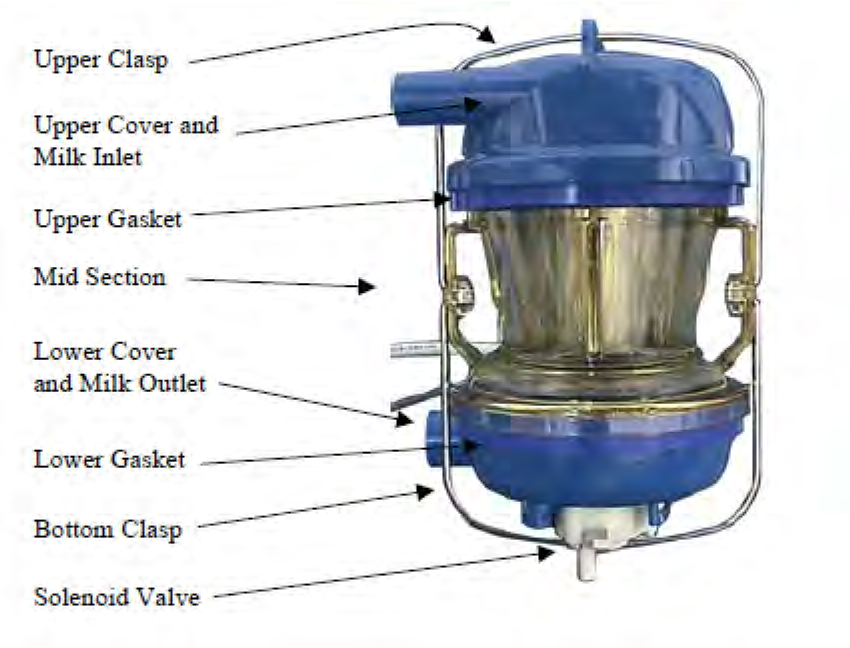
afimilk®

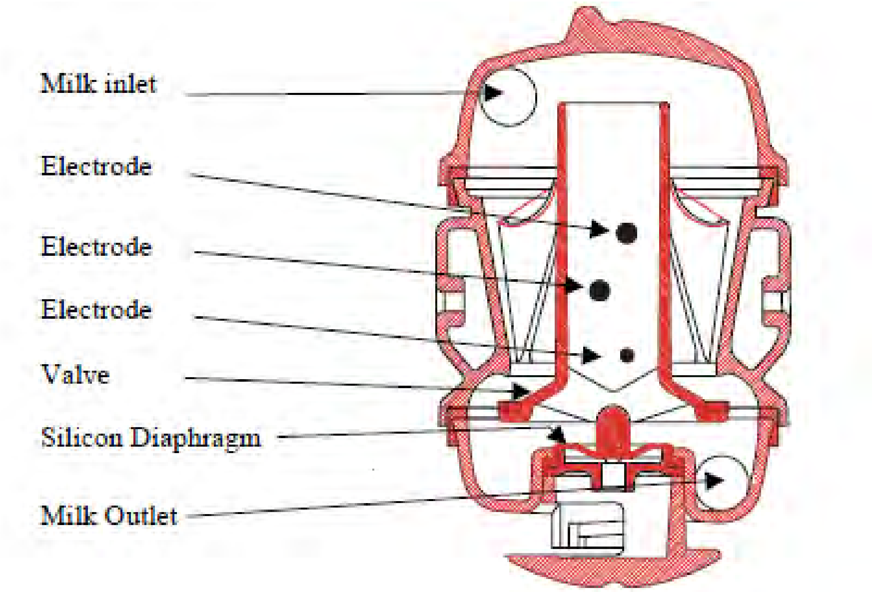
The Heart of the Dairy Farm

- **Approved Models**
  - ✓ **Afiflo 2000**
  - ✓ **Afiflo 9000**
  - ✓ **Full Flow (MM 85/MM95)**
  - ✓ **Afilite (Germania's Essential)**
  - ✓ **Afi 155 & 155i (Sheep & Goat)**
- **Low-Line Installation Only**
- **Must Use Afikim Sampler**
- **There is no meter performance report available in the current version of the Afifarm software – must interface with DC305 or PCDART for EMMR**

The Heart of the Dairy Farm

- **Routine Service**
  - ✓ Upper and Lower Gaskets
  - ✓ Clean Electrodes
  - ✓ Check and Clean Valve
  - ✓ Silicon Diaphragm Replacement





afimilk®
The Heart of the Dairy Farm

Calibration Instructions and User Manuals available from QCS if needed

afimilk

SAE Afikim
MM81 - MM85

DHIA Milk Recording And Meter Calibration

S.A.E AFIKIM
COMPUTERIZED DAIRY MANAGEMENT SYSTEM

Afi-lite Plus™
Milk Meter

(Product number 4098999)

User Manual

Kibbutz Afikim, 15148, ISRAEL
+972-4-675-4811
+972-4-675-1862
market@afimilk.co.il
http www.afimilk.co.il

February 27, 2003

This manual P/N 9040310

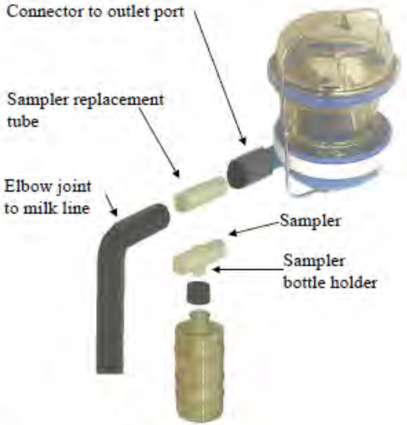
afimilk®

The Heart of the Dairy Farm

Mounting the Fat Sampler

The fat sampler is mounted between the outlet port and the elbow joint to the milk line.

NOTE:	During normal milking, when not sampling, a sampler replacement tube fills the gap reserved for the fat sampler.



Fat Sampler Operation

The fat sampler is made up of a sampling bottle and a sampler head.

Milk is sampled each time the meter body is emptied. As the milk flows out of the milk meter body, a small quantity is diverted by the sampler head into the sampler bottle. This method assures sampling during all stages of the milking session.

- The Afi 2x Sampler is only approved for use with Afikim meters.
- Cannot be used with GEA Metatron, Boumatic Perfection, or DeLaval meters
- Decoupled systems have not been tested and are not ICAR-approved
- Issues
  - Biased results
  - Sampler flooding with other meters
  - Foaming and flooding with vented inflations (impulseAir, Conewango)

AMBIC
leading best practice
in livestock health management

- The Ambic sampler is not approved for DHI programs under any conditions.
- Is not ICAR approved
- Appears to be a negative bias for fat in limited testing
- The challenge is the local milking equipment dealers are selling this sampler with on-farm meters instead of the higher-priced ICAR approved sampler for the respective meter model

BECO
DAIRY AUTOMATION INC.

- The Beco Scan Nexus is not approved recording of milk weights in DHI programs
- Is not ICAR approved
- QCS is working with Beco on testing but they have no sampler for the meter at the present time

BouMatic™

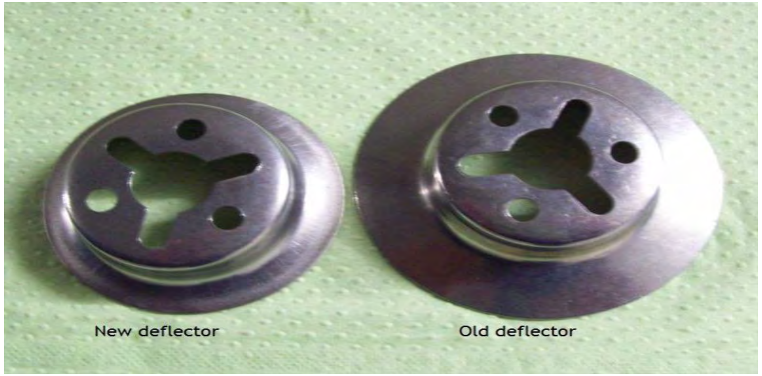
- Precision/Precision XL approved
- Also known as Model M/M+
- Must use the Boumatic Precision Sampler
- Service manual, troubleshooting guides, and calibration instructions are available from QCS.

BouMatic™

- Perfection 3000
- **Must use Boumatic Perfection Sampler with the meter**
- **Service manual, troubleshooting guides, and calibration instructions are available from QCS.**

BouMatic™

- SmartControl Meter is ICAR Approved
- Must use the Boumatic Perfection Sampler
- **Must retrofit deflector**
- **Must upgrade software**



Boumatic Provantage Report

DIAMOND S RANCH INC.
MLKG NO. IS 1
18 FEB 09
3:58 PM

ProVantage Prime

Stl	Cows	P/E	Prod	Exp	Time	#Cnd	C/AC	Cond	AvgC	MDet	MMod	RCtr	F120	Data	CIP
1	38	103	38	37	5	37	98	5.9	6.0	0	2	0	7	0	141
2	38	99	38	38	5	38	108	6.7	6.2	0	1	0	10	0	126
3	37	104	38	36	5	36	112	6.9	6.1	1	2	0	8	0	118
4	37	103	37	36	5	36	104	6.4	6.1	0	2	0	9	0	128
5	36	103	39	37	5	36	82	5.0	6.1	0	1	0	8	0	118
6	35	97	36	37	5	35	106	6.4	6.0	1	2	1	8	0	100
7	35	105	38	36	5	34	108	6.6	6.0	1	2	2	8	0	119
8	36	101	36	36	5	36	113	6.7	5.9	0	2	0	8	0	116
9	36	98	37	38	5	35	81	5.1	6.2	0	1	0	8	0	140
10	36	99	38	38	5	36	103	6.3	6.1	0	1	0	8	0	148
11	35	96	38	39	6	35	99	6.2	6.2	0	3	1	8	0	130
12	34	101	39	39	5	33	107	6.8	6.4	0	2	0	7	0	121
13	39	99	36	37	5	38	102	6.4	6.2	0	3	0	8	0	110
14	39	107	37	35	5	38	108	6.6	6.1	2	2	5	8	0	109
15	39	105	38	36	5	38	101	6.1	6.0	0	2	1	8	0	109
16	38	92	35	38	5	38	98	6.0	6.1	0	2	0	7	0	116
17	36	102	37	36	5	35	106	6.6	6.2	0	3	0	8	0	111
1	35	100	37	37	5	34	112	7.2	6.4	0	1	0	8	1	104
19	35	106	37	34	5	35	104	6.6	6.4	1	1	1	8	0	107
20	36	101	36	35	5	35	90	5.5	6.1	1	1	2	7	0	109
21	36	107	41	39	5	36	111	6.8	6.1	0	1	0	9	0	107
22	34	96	34	36	5	33	105	6.7	6.3	2	2	2	9	1	110
23	34	98	39	40	5	34	105	6.5	6.2	0	0	0	9	1	109
24	32	99	38	39	5	32	110	6.9	6.3	0	1	0	9	1	105

Boumatic SmartDairy Report

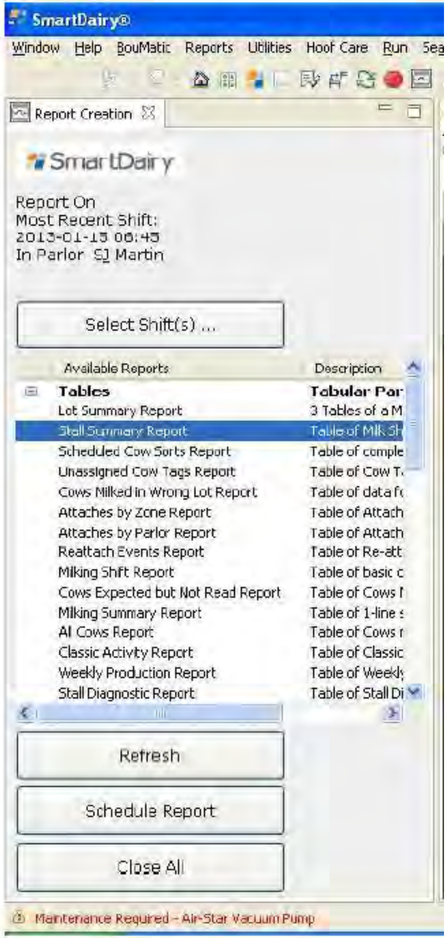
SmartDairy

Stall Summary Report
ROTARYBARN
START:2014-05-01 10:05 - STOP:2014-05-01 16:52

STALL	MILK	TOTAL LBS	AVG COND	MANU MODE	MANUAL DETACH	REATTACH	AVG LBS / MIN 60 120	MAX LBS / MIN 60 120	% OF XPCTD	MIN ATT'D	# WASH DUMPS
1	39	1690.4	6.8	2	7	0	11.7	19.0	101	5.3	131
2	40	1796.8	7.0	1	5	2	12.2	26.0	100	5.2	136
3	40	1808.6	6.9	1	7	7	12.5	29.0	106	5.3	140
4	38	1714.0	6.6	5	10	2	10.5	20.0	101	5.8	79
5	39	1737.8	7.1	4	8	4	12.4	22.0	102	5.2	138
6	40	1738.3	0.0	6	10	10	12.3	24.0	104	5.3	134
7	40	1874.4	7.1	1	4	2	12.3	21.0	106	5.4	139
8	38	1732.4	6.5	1	8	8	11.9	24.0	110	5.5	133
9	36	1671.0	7.1	2	14	9	13.1	24.0	102	5.2	141
10	39	1703.5	5.3	0	3	0	13.3	24.0	102	5.1	149
11	39	1782.0	7.3	3	7	2	11.1	25.0	103	5.7	134
12	39	1726.5	7.0	6	6	7	12.7	21.0	98	5.5	143
13	37	1605.7	7.2	4	8	2	10.0	19.0	99	5.7	154
14	38	1621.7	6.8	2	4	3	11.0	19.0	99	5.4	136
15	40	1864.0	6.9	2	4	2	11.7	25.0	103	5.5	145
16	39	1755.5	7.2	1	6	2	12.4	24.0	107	5.5	140
17	40	1783.4	0.0	0	2	4	11.9	22.0	104	5.3	134
18	38	1726.0	4.0	2	3	2	12.4	24.0	101	5.6	143
19	39	1730.0	4.1	3	5	5	11.3	17.0	101	5.4	150
20	40	1886.3	6.9	2	5	6	13.6	22.0	105	5.2	147
21	38	1674.7	6.0	3	3	4	12.4	25.0	100	5.2	147
22	38	1739.6	0.0	8	18	15	12.1	21.0	110	5.7	144
23	40	1887.6	6.9	0	6	6	14.9	22.0	113	4.8	169
24	40	1561.0	7.1	3	4	3	11.2	19.0	96	5.1	164
25	39	1765.5	7.0	2	7	3	11.1	17.0	101	6.0	163
26	40	1980.3	6.8	4	6	3	12.8	22.0	110	5.7	132
27	38	1616.3	0.0	1	5	5	11.1	21.0	102	5.8	132
28	37	1613.7	7.3	3	4	2	12.4	22.0	101	5.4	135
29	37	1586.9	6.4	3	6	3	11.7	24.0	101	5.6	141
30	39	1726.6	7.1	1	2	2	13.0	22.0	103	5.3	133

reported: 2014-05-15 10:24

Boumatic SmartDairy Report



Boumatic SmartDairy Report

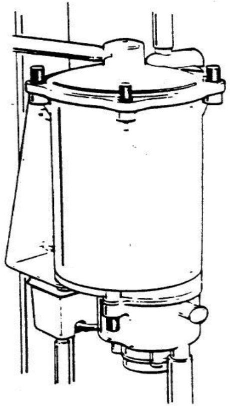
STALL SUMMARY REPORT	
STALL	This column displays the stall number in the zone.
MILK	This column displays the number of cows that had attaches at this stall during the milking shift.
TOTAL WT	This column displays the total amount of milk produced at this stall during the milking shift.
AVG COND	This column displays the average conductivity of the milk produced at this stall during the milking shift.
MANUAL MODES	This column displays the number of times that the milk meter of the stall was put into Manual Mode.
MANUAL DETACHES	This column displays the number of manual detachment events recorded by the milk meter(s) of particular stall.
REATTACHES	This column displays the number of reattaches at the stall during the milking shift.
AVG WT/MIN 60 120	This column displays the average quantity of milk produced at the stall during the time duration of 60 to 120 seconds after attach. The value is given as a rate of milk produced per minute.
MAX WT/MIN 60 120	This column displays the maximum quantity of milk produced at the stall during the time duration from 60 to 120 seconds after attach. The value is given as a rate of milk produced per minute during the milking shift.
% OF XPCTD	This column displays the percentage of milk obtained relative to that of which was expected.
MIN ATT ` D	This column displays the duration in minutes for which the milking meter was attached at this stall during the milking shift.
# WASH DUMPS Or MINS above WASH TEMP	For all detachers except the AMI 5450, this column displays the number of wash dumps for the stall for a milking shift prior to the one currently selected. Previous milk shift wash dumps are shown because this report must be generated immediately after a milk shift was ended and thus, no wash dumps will be recorded for the current shift. For the AMI 5450 detachers, the number of minutes the wash temperature was above the wash temperature threshold is recorded.

DAIRYMASTER

- **Approved Models**
  - ✓ **Weighall**
- **Both high line and low-line installations are approved**
- **No meter performance report in current Dairymaster Milk Manager software**
- **Dairymaster recently changed the dump cycle in software – affects accuracy of meter**
- **Weighall meter could be decertified if Dairymaster does not retest it in a timely fashion**

DAIRYMASTER

- **Challenges with the Dairymaster subsampler**
- **Mixing of milk is crucial before sampling due to shape of sampler**
  - **10 seconds mixing time**
  - **Complete drainage of sampler**
- **Failure to properly mix subsample can result in overestimating milk fat and SCC values**
- **High carryover potential if sampler is not emptied**



- **Approved Models**
  - ✓ **Flomaster**
  - ✓ **MM15 (Flomaster Pro)**
  - ✓ **MM25/MM25W/MM27**
  - ✓ **SG (Sheep & Goat)**
  - ✓ **Delpro MU480**
- **Must use proper DeLaval sampler for each model**
- **All meters are low-line except for Delpro MU480**
- **New meter performance report in Delpro software**

DeLaval

MM15 (Flomaster Meter)

- **Must use the correct sampler**
- **Fill and dump meter – unaffected by vented inflations**
- **Calibration instructions and troubleshooting guides available from QCS**

DeLaval

MM25/MM27BC Meters

- Must use the correct sampler
- Sensor meter from SCR – reported issues with vented inflations
- Calibration instructions and troubleshooting guides available from QCS

DeLaval

Alpro/Delpro Report for Calibration of MM25/27 Meters

- Can be calibrated every month
- Uses milk shipped weights
- Must enter new bias values into meter

Milk Meter Calibration

Save File... Print...
Refresh Close

MAYER FARMS INC
ALPRO Time: 2:00 09.04.10

Milk Meter Calibration

Current calibration factor: 1.00 Update...
Last calibration date: -

Save the new BIAS values...

MPC Parlour Pos	Relative Yield	Current BIAS	New BIAS	MPC Parlour Pos	Relative Yield	Current BIAS	New BIAS
1	97.16	1000	1029	21	97.87	1000	1021
2	97.43	1000	1026	22	99.39	1000	1006
3	98.57	1000	1014	23	98.73	1000	1012
4	100.00	1000	1000	24	98.48	1000	1015
5	98.17	1000	1018	25	97.63	1000	1024
6	98.42	1000	1016	26	98.80	1000	1012
7	98.49	1000	1015	27	98.79	1000	1012
8	99.78	1000	1002	28	97.61	1000	1024
9	97.86	1000	1021	29	99.23	1000	1007
10	99.50	1000	1005	30	97.88	1000	1021
11	98.08	1000	1019	31	99.02	1000	1009
12	98.71	1000	1013	32	98.25	1000	1017
13	98.85	1000	1011	33	98.66	1000	1013
14	96.90	1000	1031	34	99.12	1000	1008
15	96.89	1000	1032	35	98.50	1000	1015
16	96.07	1000	1040	36	97.99	1000	1020
17	97.59	1000	1024	37	98.80	1000	1012
18	98.77	1000	1012	38	98.77	1000	1012
19	98.31	1000	1017	39	97.36	1000	1027
20	98.84	1000	1011	40	98.69	1000	1013

- The E-Z Sampler is not approved for DHI programs under any conditions.
- Is not ICAR approved
- Appears to be a negative bias for fat in limited testing
- The challenge is the local milking equipment dealers are selling this sampler with on-farm meters instead of the higher-priced ICAR approved sampler for the respective meter model

GEA

- **Metatron Meter**
- **Approved Controllers**
  - ✓ **Metatron 12**
  - ✓ **S21/P21**
  - ✓ **Dematron 70**
  - ✓ **Dematron 75**
- **Low-Line Installation Only**
- **Must Use GEA/Westfalia Sampler**
- **Reports of Sampler Flooding with Higher Milk Flow Rates**

GEA

Reports of Metatron Meters reading high after calibration with new CircoTop MBX Fluid – QCS and ICAR RSD-SC are investigating

GEA Farm Technologies

CircoTop MBX
New calibration fluid for Metatron milk meters

The new calibration fluid CircoTop MBX for calibrating milk meter systems with Metatron milk meters will be available from the beginning of 09/2010.

- CircoTop MBX ensures simple and exact calibration of ICAR/LKV approved Metatron milk meter systems.
- CircoTop MBX is replacing CircoTop MB.
  Any remaining amounts of CircoTop MB can still be used up.

ation

Metatron report

DairyPlan DPList 5.212.022 NO10C108 BOS 4 1-02-09 6:45

Meter	Number Weights	No Cow#	Cow# Hand	Cow# Auto	Auto %	----Averages---- Milk	Time	%Dev	Total Milk
54	47	0	0	47	100	27.11	5.0	0	1274
55	46	0	0	46	100	27.79	5.1	1	1278
56	47	0	0	47	100	31.78	5.1	9	1494
57	45	0	0	45	100	27.42	5.1	-5	1234
58	47	0	0	47	100	28.78	5.1	7	1352
59	46	0	0	46	100	26.76	4.8	-3	1231
60	46	0	0	46	100	26.96	4.8	-2	1240
61	47	1	0	46	100	25.81	5.0	-0	1213
62	47	0	0	47	100	24.92	4.8	-6	1171
63	47	1	0	46	100	28.43	5.0	3	1336
64	46	0	0	46	100	28.17	4.8	4	1296
65	46	0	0	46	100	25.97	5.0	-5	1195
66	46	0	0	46	100	26.98	5.0	-1	1241
67	46	0	0	46	100	26.73	4.9	-7	1230
68	45	0	0	45	100	26.49	5.0	-3	1192
69	47	0	0	47	100	28.53	5.0	2	1341
70	46	0	0	46	100	27.88	5.1	-1	1283
71	45	0	0	45	100	25.84	4.9	-0	1163
72	46	0	0	46	100	26.23	5.0	-3	1206
	3302	8		3294	100	26.67	4.9	-1	88060

NO QUALIFYING DATA TO PRINT

0 Cows identified more than once

0 Unknown responders

Metatron Meter Report

Metatron yield analysis

At the end of the milking session, the Metatron yield analysis gives an overview of the key figures for the milking session.

An identification statistic (A) gives an idea of the quality of automatic identification. Milk quantities without identification are not included in this because the causes are too numerous.

In this example, the percentage deviation (B) of the amount milk obtained from the amount of milk expected shows a negative trend in the herd.
If individual Metatron units show two-figure deviations over several days, this points to a fault.

Metatron Performance Analysis

Last Milking date and time
4-04-05 3:39 - 7:27

	Number	No	Cows	Cows	Auto	----Average	----	----	Total
Meter	Weights	Cows	Hand	Auto	%	Milk	Time	%Dev	Milk
1	14	0	0	14	100	13.05	5.4	-2	183
2	14	0	0	14	100	14.52	6.3	2	203
3	14	1	0	13	100	13.88	6.7	-1	194
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	13	1	0	12	100	13.08	5.9	-2	170
6	13	0	0	13	100	13.88	7.2	1	181
7	13	1	0	12	100	14.32	5.4	10	186
8	13	0	0	13	100	12.88	6.7	-2	167
9	13	1	0	12	100	12.38	6.0	-4	161
10	13	0	0	13	100	13.35	6.5	-1	174
11	13	0	0	13	100	15.73	6.1	8	205
12	13	0	0	13	100	12.48	6.5	1	162
13	13	0	0	13	100	13.28	6.5	-0	173
14	13	0	0	13	100	12.58	5.8	-3	164
15	13	0	0	13	100	13.43	6.3	0	175
16	13	0	0	13	100	14.92	7.0	2	194
17	13	0	0	13	100	12.25	6.1	1	159
18	13	1	0	12	100	13.29	6.1	0	173
19	13	0	0	13	100	11.66	5.7	-4	152
20	13	0	0	13	100	13.92	6.9	0	181
21	13	0	0	13	100	13.05	6.4	-0	170
22	14	0	0	14	100	12.39	6.6	-4	173
	290	5	A	285	100	13.33	6.3	B	3868

NO QUALIFYING DATA TO PRINT

0 Cows identified more than once

0 Unknown responders

The results of previous milking sessions can also be displayed by shifting the visible section of the window.

Quality Certification Services Inc.

PRECISE DAIRY FARMING

- Unapproved Meter from SCR
  - ✓ FFS 30 Sensor
  - ✓ ED 200 Display
  - ✓ MC 200 Controller
- Marketed by Dairy Micro Logic
- Part of Semex ai-24 program
- SCR has not tested or applied for ICAR testing/approval

Accurate ID is Important

Cow ID and Stall ID are essential to the Meter Performance Report

- Electronic ID systems
  - Manufacturer ID – transponders
  - Third Party EID tags and readers
  - *Primary Source of Error – TECHNOLOGY*
- Manual ID entry
  - Cow ID is keyed on the controller in the milking stall
  - Usually leg bands or visual cow number
  - *Primary Source of Error - HUMAN*

Potential Sources of Error in Data Recording

Accuracy	Excellent	Good	Fair
Milk Meter	98%	98%	98%
Controller	99%	99%	99%
Animal ID	100%	97%	95%
Milker (Human)	99%	99%	99%
Data Transfer	100%	100%	100%
Maximum Data Accuracy from On-Farm System	**96%**	**93%**	**90%**

- **Calibrating the milk meter alone may not be sufficient**
- **Errors also exist when using portable meters for herd recording**
- **Need to review entire system and minimize errors**

Quality Certification Services Inc.

Meter Performance Reports cannot be used with..

- Herds with incomplete identification or EID system challenges
- Herds with one or more failing/non-communicating controllers
- Herds with one or more missing or out-of-service meters
- Herds where all strings do not have the same milking frequency (some strings 4x, some strings 2x) – may be solved with additional programming/logic

Using Third-Party software

- **Interface with manufacturer’s software**
  - ***GEA Westfalia (Dairy Plan)***
  - ***Afikim (Afimilk, Afifarm)***
  - ***Boumatic (Provantage, Metrix)***
  - ***DeLaval (Alpro)***
  - ***DairyMaster***
  - ***Universal***

- **Short List of Vendors**
  - ***Dairy Comp 305 (Valley Ag Software)***
  - ***PCDart (Dairy Records Management Systems)***

PCDart 817 EMMR

t34120121 33m Ref: 37m08-23-08 082308 06:53 Pg 1
t817 - Milking Report - Electronic Milk Meter Monitoring Report - Date 08-22-2008

Stall No.	No. Milkings	No. Obs.	% Difference From Expected	
1	10	71	+2.0	
2	10	71	+3.0	
3	10	69	-5.8	Diff. 5%
4	10	67	-1.8	
5	10	66	+0.4	
6	10	58	-0.1	
7	10	59	+0.6	
8	10	55	+0.4	
9	10	74	+0.7	
10	10	75	+6.7	Diff. 5%
11	10	77	+1.1	
12	10	77	+0.6	
13	10	78	-2.9	
14	10	73	-3.1	
15	10	67	-0.7	
16	10	63	-1.9	

Electronic Milk Meter Monitoring Report (EMMMR) Detail
Percent Difference From Expected By Milking

	********************** Date/Milking Number **********************									
Stall No.	08-22 1	08-22 2	08-21 1	08-21 2	08-20 1	08-20 2	08-19 1	08-19 2	08-18 1	08-18 2
1	+5.5	+2.8	+1.7	-1.1	+4.9	+5.8	-2.5	+3.2	+2.7	-1.3
2	+1.4	+5.4	-2.8	-0.1	-0.5	+4.4	+8.7	+1.1	+13.6	-0.6
3	+3.9	-0.5	+8.9	+2.2	-1.4	-96.5	+5.2	+8.3	-6.2	-5.0
4	-1.3	-8.1	+0.5	+4.1	-6.3	-4.1	-2.7	-0.9	-0.9	-1.5
5	-1.8	+2.7	-3.7	+3.5	+0.0	+7.2	-0.7	-0.8	+0.5	+0.5
6	-0.9	-1.7	+0.9	-2.9	-0.2	+6.8	-1.7	-0.3	-0.2	-0.4
7	+1.4	-9.8	+3.7	-5.2	+4.0	+6.0	+3.2	-4.8	-1.0	+4.6
8	-1.1	-2.9	-5.1	-3.2	+1.5	+3.7	+2.3	+7.7	-1.4	+3.6
9	+2.0	+1.6	+1.7	-2.1	+0.0	+6.1	-0.5	-1.6	+0.0	+0.7
10	+6.6	+7.8	+13.6	+2.0	+7.4	+15.5	+2.9	+4.8	+1.2	+4.3
11	+6.0	-2.4	-2.2	+6.5	-2.3	+5.0	+0.5	-0.3	+0.0	+1.8
12	-2.8	+0.9	-0.7	-0.5	+6.5	+4.9	-1.3	-0.7	+1.3	+0.0
13	-0.2	+2.1	+1.9	-1.7	-11.5	-0.7	-6.5	-1.2	-4.9	-5.4
14	-9.2	-3.6	-2.4	-2.9	-4.7	-1.2	+0.0	-3.8	-4.5	+1.2
15	-1.6	+0.8	-1.3	-1.8	+2.2	+12.1	-4.2	-10.5	+2.1	-3.1
16	-10.2	+1.4	-12.1	+2.6	+3.0	+8.4	-0.7	-2.6	-3.0	+0.5
AV.	+0.1	-0.1	+0.1	+0.2	+0.0	+0.1	-0.1	-0.2	-0.2	-0.2

Detail information for each milking for each cow stored in file METERDTL.CSV
File is located in PCDART 34120121. Open file with spreadsheet program.

Acceptable 817 EMMR

Stall No.	No. Milkings	No. Obs.	% Difference From Expected
101	10	252	-1.1
102	10	246	+1.6
103	10	252	0.0
104	10	257	-0.1
105	10	258	-0.4
106	10	253	-1.9
201	10	259	-0.3
202	10	260	+3.7
203	10	254	+0.7
204	10	258	+0.2
205	10	260	-0.8
206	10	254	-2.0

Stall No.= Station (first char.), Side (next char.) and Stall (last 2 chars.)

817 - Milking Report - Electronic Milk Meter Monitoring Report - Date 02-21-2011

Electronic Milk Meter Monitoring Report (EMMMR) Detail
Percent Difference From Expected By Milking

	**********************				Date/Milking Number		**********************			
Stall No.	02-21 1	02-21 2	02-21 3	02-20 1	02-20 2	02-20 3	02-19 1	02-19 2	02-19 3	02-19 4
101	+1.1	+2.4	-3.5	-2.4	-2.1	+1.4	-7.7	+0.4	-1.2	+1.1
102	+9.2	-0.7	-2.7	+1.6	+5.8	+1.8	+3.3	+2.1	-0.5	-4.5
103	-1.4	+0.7	+1.2	+1.1	-1.0	-1.4	+2.1	+0.1	-0.6	-1.2
104	-2.4	-3.1	-0.2	+2.0	+4.1	-1.3	+1.1	-2.6	-0.3	+2.5
105	-2.2	-1.6	+1.4	+4.8	-2.5	-0.4	+1.6	-0.3	-4.2	-1.0
106	+2.3	-5.8	-2.3	-3.5	-3.7	-1.4	-0.9	+0.2	-1.4	-2.8
201	-4.6	-2.5	+2.6	+1.3	-0.3	-0.6	-3.4	+1.9	+1.1	+1.1
202	+1.9	+3.2	+5.7	+2.8	+2.4	+4.9	+5.9	+2.3	+3.7	+4.2
203	-0.4	-0.5	+2.1	+2.0	+0.8	+1.3	+0.7	+0.6	-2.0	+2.1
204	+1.4	+1.1	+0.5	-2.9	-1.2	+2.5	+0.7	-0.7	+1.8	-0.6
205	+0.0	-4.0	-1.3	+0.6	-0.1	-2.0	-2.4	0.0	+2.3	-1.9
206	-3.3	-2.5	-2.8	-5.3	+0.2	-4.1	-0.9	-1.7	+2.4	-1.2

DC 305 – Parlor Performance Report

POTTER M1.txt

```
- Dairy Comp 305 ------------- NORTH STAR ACRES ------------------------ Page {$PAGE}
- Command   : PARLOR\VM1P                                                    -
- Expanded:                                                                  -
-                                                                            -
- NORTHSTAR ------------------ North Star Acres --------------------- 7/28/09---
```

Milking report for 7/28/09 Milking 1 at 12:07 PM 3.04E 12

PEN	Total Milk	Milk /Hr	Milk /Cow	Cows	Cows /Hr	Total Time	Start Time	Stop Time	Avg #/m	Avg Dur	Avg Dev	Not ID
1	1399	2268	22	64	103	0:37	4:09	4:47	5.0	4.5	1	4
2	1663	1918	16	106	122	0:52	4:57	5:49	3.7	4.3	0	6
3	1912	383	22	88	17	4:59	5:54	10:54	4.4	5.1	-1	3
5	4176	1482	29	146	51	2:49	6:48	9:38	5.7	5.3	-1	7
6	4672	1752	33	142	53	2:40	8:18	10:58	6.0	5.7	0	8
4	2130	2778	30	71	92	0:46	9:49	10:35	5.6	5.6	0	3
9	490	2100	41	12	51	0:14	10:45	10:59	5.4	8.0	0	0
Total	16442	2406	26	629	92	6:50	4:09	10:59	5.2	5.2	0	31

Description	Pen	1	2	3	5	6	4	9
% Units were attached	33	31	36	6	19	21	36	28
Milk / stall / hour	100	92	79	15	61	73	115	86
Cows / stall / hour	3.8	4.2	5.0	0.7	2.1	2.2	3.8	2.1
Flowrate 0 to 15 seconds	1.4	1.1	1.0	1.0	1.5	2.0	1.5	1.5
Flowrate 15 to 30 seconds	5.6	5.0	4.1	4.8	5.8	6.9	6.3	7.0
Flowrate 30 to 60 seconds	5.3	5.2	3.4	4.2	5.6	6.1	6.7	8.0
"Peak" Flowrate	7.0	7.2	4.4	5.7	7.7	8.3	7.8	8.8
Milk in the first 2 minutes	11	11	7	9	12	14	13	15
Percent milk in 2 minutes	43	52	47	42	43	41	44	36
Percent time in low flow	20	21	30	22	17	17	18	19
Seconds in low flow	64	57	79	69	57	60	61	96

Error Summary:	Pen	1	2	3	5	6	4	9
Reattach	12	1	2	1	4	1	3	0
No Letdown	41	4	6	6	9	11	5	0
Manual Mode	10	0	2	3	0	1	1	3
Early Falloff	1	0	0	0	1	0	0	0
Late Rehang	8	0	1	1	2	2	2	0
Manual Detach	28	4	1	2	5	6	8	1
Total	99	9	12	13	21	21	19	4

Stall	Cows	Dev	Milk	Time	Flow	Cond	Peak	Fall	Mode	MDet
1	30	0	23	5.0	4.7	9.2	6	1	0	1
2	30	0	25	5.7	4.6	9.3	5	0	2	2
3	30	0	26	5.4	4.7	9.2	6	1	1	1
4	28	0	26	5.7	4.6	9.1	5	1	0	0
5	28	0	24	5.0	4.9	9.2	6	0	0	0
6	27	0	26	5.3	5.1	8.7	6	1	1	1
7	26	1	25	4.7	5.4	8.5	8	0	0	1
8	26	-1	25	5.2	5.3	9.2	7	2	0	2
9	26	-2	23	4.8	5.0	9.9	7	0	1	0
10	26	0	26	5.4	5.0	9.4	6	1	1	1
11	26	1	26	5.8	4.9	9.1	7	5	1	1
12	26	0	24	4.9	5.0	9.4	6	2	0	2

Page 1

POTTER M1.txt

Stall	Cows	Dev	Milk	Time	Flow	Cond	Peak	Fall	Mode	MDet
13	29	3	29	5.5	5.3	9.4	6	1	0	2
14	28	0	28	5.2	5.5	9.2	7	0	0	0
15	29	-1	26	5.0	5.3	9.6	7	1	0	1
16	29	-1	26	5.2	5.0	9.7	7	1	1	1
17	29	0	27	5.1	5.3	9.6	6	1	0	1
18	29	0	25	5.0	5.1	9.8	7	0	0	2
19	28	0	24	4.9	5.0	9.2	6	1	0	2
20	26	1	27	4.8	6.0	8.8	8	1	1	3
21	26	0	25	4.7	5.3	8.9	7	0	0	0
22	26	24	24	4.5	5.4	8.9	7	0	0	0
23	26	0	26	5.3	5.1	8.7	6	1	1	4
24	26	0	28	5.1	5.9	9.1	8	1	0	0
Average	28	1	26	5.1	5.1	9.2	7	1	0	1

Side	Cows	Dev	Milk	Time	Flow	Cond	Peak	Fall	Mode	MDet
1	329	0	25	5.2	4.9	9.2	6	14	7	12
2	331	2	26	5.0	5.3	9.2	7	8	3	16
Average	330	1	26	5.1	5.1	9.2	6	11	5	14

DairyCOMP 305

Page 2

Deviating Meters on the Report

- It does not necessarily mean the meter is out of calibration…
  - But if one meter is out of tolerance on the report, the whole report is not usable

- Time to be a detective and isolate/correct errors…
  - Primary contacts
    - *Dairy Manager*
    - *Representative(s) from Herd Recording Organization*
  - Secondary contacts
    - *Milker(s)*
    - *Representative from Equipment Manufacturer*

Sources of Variation – ID System

<u>Possible cause(s)</u>

- **Inaccurate ID reads from automated system**
- **Incomplete herd ID**
- **Duplicate animal ID**
- **Data entry errors by milking personnel**

817 - Milking Report - Electronic Milk Meter Monitoring Report - Date 07-31-2009

Electronic Milk Meter Monitoring Report (EMMMR) Detail
Percent Difference From Expected By Milking

Stall No.	********************** Date/Milking Number **********************									
	07-31 1	07-31 2	07-30 1	07-30 2	07-29 1	07-29 2	07-28 1	07-28 2	07-27 1	07-27 2
80	+10.1	+49.2	+14.6	-8.0	+7.9	+8.2	+11.4	+19.4	+18.7	+18.9
81	-0.1	+52.4	+10.6	+3.3	+4.7	+13.7	+9.9	+24.8	+10.0	+14.8
82	+1.1	+27.3	-0.8	+9.5	+10.0	+19.9	+16.1	+8.8	+29.2	+12.5
83	+10.3	+47.0	+5.0	+6.8	+6.8	+15.5	+13.3	+26.2	+7.3	+19.6
84	+26.9	+56.6	-2.6	+9.8	+5.7	-0.2	+13.3	+17.8	+39.0	-8.6
85	-8.9	+19.4	+5.3	+2.8	-3.5	+11.3	+21.4	+31.4	+20.9	+18.3
86	+116.5	+39.0	+0.9	-28.2	+5.7	+12.7	+15.0	+22.2	+39.3	+27.7
87	+2.0	+59.2	+2.5	+27.5	+0.6	+16.2	+2.3	-5.1	+25.8	+18.3
88	+4.9	+23.8	+22.5	-98.6	+21.8	-24.9	-9.0	+40.3	+44.9	+24.5
89	-4.9	+42.5	+42.5	+73.6	+36.3	+163.0	+30.1	+33.2	+14.9	+18.6
90	+18.6	+10.7	+19.8	+39.0	+27.3	+22.4	+22.4	+11.9	-1.9	+110.9
91	+110.9	+51.5	+12.3	+33.7	+7.9	+51.2	+8.5	+5.4	+18.5	+113.5
92	-11.8	+59.7	+64.5	+24.8	+53.8	+57.8	+57.5	+48.5	+77.9	+27.9
93	+54.8	+60.1	+74.9	+73.2	+20.8	+23.7	+39.6	+21.1	+28.3	+41.8
94	+17.4	+46.3	+48.4	+38.3	+38.4	+29.7	+8.8	+15.6	+54.6	+54.6
95	+41.9	+51.8	+43.6	+66.2	+12.1	+100.5	+39.8	+40.2	+25.9	+45.8
96	+20.5	+43.9	+35.6	+56.3	+78.5	+60.1	+19.6	+27.7	+33.5	+18.4
97	+18.4	+40.9	-13.3	+79.1	+12.3	+103.0	+13.6	+91.0	+45.6	-1.6
98	+39.6	+51.0	+23.0	+103.0	+7.4	+98.8	+28.4	+24.9	+28.9	+58.3
99	-21.5	+31.5	+7.7	+30.7	+1.8	+35.8	+26.6	+72.4	+32.9	+83.7
100	+36.5	+25.7	+70.9	+116.0	+84.3	+86.5	+31.8	+60.3	+44.6	+54.8
101	-11.8	+83.8	+132.8	+194.7	+27.3	+77.7	+22.4	+99.0	-28.5	+116.6
102	+11.6	+29.2	-5.0	+39.8	+6.1	+46.4	+4.0	+16.7	-19.2	+5.7
103	-3.6	+46.8	+89.7	+80.2	+111.3	+49.7	+61.4	+22.1	+29.4	+119.8
AV.	+13.8	+43.7	+27.6	+40.6	+24.4	+44.9	+20.2	+32.3	+25.9	+40.0

Detail information for each milking for each cow is stored in file MeterDtl.csv
File is located in C: PCDART 12184502. Open file with spreadsheet program.

Sources of Variation – Equipment

- **Reattachment of milkers – Is the total milk weight computed?**
- **Treated cows – do they bypass the meter?**
- **Incomplete letdown by cows**
- **Meter out of calibration**

817 - Milking Report - Electronic Milk Meter Monitoring Report - Date 06-25-2009

Electronic Milk Meter Monitoring Report (EMMMR) Detail
Percent Difference From Expected By Milking

Stall No.	06-25 1	06-25 2	06-25 3	06-24 1	06-24 2	06-24 3	06-23 1	06-23 2	06-23 3	06-23 4
	************************* Date/Milking Number									
1	+8.1	+2.9	+6.9	+7.8	-0.4	-2.4	+1.6	+1.0	+3.0	+8.9
2	+0.8	+9.5	+4.7	-1.5	+9.6	+5.4	+6.9	+5.7	+3.8	+1.5
3	+4.6	+12.3	+8.4	+9.9	+6.9	+2.1	+6.4	+8.4	+2.9	+2.3
4	+8.0	+2.5	-4.1	+2.8	+3.4	+9.5	+7.2	+4.3	+7.5	+2.4
5	+9.4	+11.7	+3.3	-4.6	+3.7	+6.6	+5.0	-3.0	+13.5	+6.7
6	-2.3	+1.0	+0.6	-0.8	+0.3	-2.3	+4.1	+0.3	-0.9	-1.3
7	+10.4	+6.3	-2.3	+6.0	+7.6	+3.6	+4.7	+6.2	+8.0	+10.0
8	+6.4	-0.6	+0.2	+3.8	+3.3	+1.1	+2.4	+5.8	+6.6	+2.7
9	+4.1	+4.3	+3.3	-0.5	-2.1	+2.3	+1.7	+7.9	+3.8	+8.4
10	+0.3	+4.1	+12.5	+7.8	+0.2	+0.2	+7.8	+8.8	+9.5	+6.3
11	+11.4	-1.6	+9.8	+5.6	+1.9	+2.7	+4.3	+4.0	+1.3	-0.2
12	+2.4	+13.1	+2.2	+4.6	+6.2	+3.0	-5.5	+3.1	-1.6	-0.3
13	-3.3	+0.0	+3.3	-0.6	+2.1	+4.1	+7.8	+5.5	+3.4	-1.0
14	+2.4	+4.2	+13.0	+9.5	+7.1	+6.5	+11.7	+9.4	+6.1	+8.8
15	-5.9	-5.5	-6.2	-3.4	+4.0	-3.8	-5.3	-10.9	-4.9	-11.6
16	+10.3	+10.2	+6.2	+9.8	+14.7	+6.2	+6.3	+10.3	+6.3	+10.6
17	-27.0	-21.9	-22.1	-28.2	-30.1	-23.8	-23.8	-29.2	-24.0	-19.0
18	+1.8	+6.9	+8.2	+9.6	+8.1	+7.8	+13.3	+5.1	+6.2	+1.2
19	-23.3	-22.9	-25.2	-24.3	-27.3	-22.5	-26.7	-22.4	-24.9	-20.1
20	+3.3	+3.2	+10.4	+8.8	-1.2	+15.1	+9.3	+9.7	+6.0	+5.0
21	-25.7	-35.5	-27.9	-18.3	-26.2	-22.0	-26.5	-26.1	-24.4	-25.6
22	-13.1	-14.8	-15.4	-12.1	-10.8	-15.4	-18.5	-21.2	-17.4	-14.2
23	+5.3	+4.4	+6.3	+7.9	+6.2	+8.1	+1.2	+3.1	-2.6	+3.2
24	+3.2	-1.4	-5.7	-0.5	+1.7	-5.0	-1.2	-2.3	-0.6	-2.9
AV.	-0.3	-0.3	-0.4	0.0	-0.5	-0.5	-0.2	-0.7	-0.6	-0.8

Detail information for each milking for each cow is stored in file MeterDtl.csv
File is located in C: PCDART 23150461. Open file with spreadsheet program.

Sources of Variation - Equipment

- Meters installed properly?
- **Meter out of calibration?**
- Modifications to milking system?

Electronic Milk Meter Monitoring Report (EMMMR) Detail
Percent Difference From Expected By Milking

Stall No.	03-18 1	03-18 2	03-18 3	03-17 1	03-17 2	03-17 3	03-16 1	03-16 2	03-16 3	03-15 1
	**********	**********	**********	**********	Date/Milking Number	**********	**********	**********	**********	**********
1	+0.0	+1.7	+1.2	+5.1	+5.4	+0.2	+2.9	+2.0	+0.2	+3.7
2	+4.4	+4.5	+5.9	+9.6	+9.9	+1.5	+3.7	+10.0	+1.2	+4.7
3	+2.2	+4.8	+2.9	+3.7	+5.0	-1.2	+4.5	+8.8	+1.2	+5.5
4	-34.2	-37.1	-31.4	-30.6	-25.0	-15.5	-31.0	-30.4	-38.8	-37.4
5	+5.2	+8.2	+4.0	+3.2	+13.4	+3.6	+6.2	+2.0	+2.6	+5.6
6	+0.1	-5.1	-3.4	-5.2	-6.2	-1.2	-9.9	-6.6	-4.7	-1.3
7	+4.5	+4.2	+0.3	+0.9	+0.0	+4.7	+3.8	+7.2	+4.2	+4.6
8	+1.4	+5.1	+3.2	+2.3	-1.2	-1.3	+1.1	+5.3	+2.9	-4.1
9	+2.4	+0.4	+0.2	+1.3	-3.2	-3.3	+8.5	-2.7	-0.5	+3.8
10	+7.4	+6.7	+3.7	-1.5	+8.0	+0.0	+0.6	+1.7	+7.3	+9.8
11	-0.4	+0.0	-1.0	+5.3	-6.5	+0.5	+7.1	+4.6	+9.9	-0.2
12	+4.4	+6.1	+9.6	+7.8	+1.4	+6.6	+2.5	-3.0	+5.3	+6.9
AV.	+0.3	+0.2	+0.1	+0.0	+0.4	-0.4	+0.6	-0.2	-0.3	+0.1

Detail information for each milking for each cow stored in file METERDTL.CSV
File is located in PCDART 32200303. Open file with spreadsheet program.

Sources of Variation – Missing Milkings

Electronic Milk Meter Monitoring Report (EMMMR) Detail
Percent Difference From Expected By Milking

Stall No.	07-30 1	07-30 2	07-29 1	07-29 2	07-28 1	07-28 2	07-27 1	07-27 2	07-26 1	07-26 2
	************************ Date/Milking Number									************************
80	+4.6	-4.2	+5.2	-4.2	+0.1		+22.9	-2.1	+4.5	-3.6
81	+3.6	-5.4	+4.1	-5.4	-4.1		+7.6	+0.9	-0.6	+10.1
82	-1.7	-6.2	-2.9	-6.2	+0.0		-3.8	-0.6	+4.4	-6.9
83	+15.0	+10.1	+3.2	+10.1	+11.0		+0.4	-3.4	+3.3	+2.1
84	+9.1	+14.0	+9.5	+14.0	-7.4		+1.2	+11.3	-5.1	+10.3
85	+4.8	+7.4	+5.1	+7.4	+2.3		+9.6	-4.6	+6.0	-1.5
86	-97.5	-96.4	-98.0	-96.4	+6.1		+9.9	+0.0	+4.9	-3.5
87	+1.8	-0.7	+2.4	-0.7	+4.3		-0.7	+6.1	-0.6	+5.2
88	+5.1	+14.1	+5.5	+14.1	+1.4		+0.5	-12.4	+23.6	+4.0
89	-2.0	+3.7	-1.5	+3.7	+1.2		+2.5	+1.5	+9.3	+1.3
90	-9.7	-0.3	-9.3	-0.3	+1.5		-3.2	-0.3	-2.7	+3.6
91	+8.4	-5.2	+3.8	-5.2	-6.3		-1.6	-6.3	-6.5	-6.0
92	+3.7	+3.3	+8.5	+3.3	-0.1		-3.0	+3.5	-4.3	-6.2
93	-6.9	+2.6	-6.6	+2.6	-1.3		-3.8	+8.2	+2.0	+0.4
94	+4.2	+5.0	+4.6	+5.0	-3.9		-2.5	-8.0	+8.1	-0.7
95	+5.4	+1.9	+4.1	+1.9	-11.3		-2.2	-0.8	+1.9	-0.7
96	-3.0	+0.6	-8.4	+0.6	+3.5		+3.0	+4.5	-19.7	+0.0
97	+5.3	+10.4	+5.7	+10.4	+2.5		+3.9	+8.0	+1.9	+0.0
98	+0.5	+6.0	+3.0	+6.0	+0.4		-6.4	+1.7	+4.6	+1.2
99	+0.7	+22.3	+0.8	+22.3	+1.1		+4.5	-2.1	+4.0	-1.6
100	-0.1	+3.4	+0.3	+3.4	+5.8		-14.7	-3.4	+0.1	-3.3
101	+2.0	+7.7	+2.3	+7.7	-3.4		+4.3	+8.4	-8.4	-2.1
102	-2.9	+1.2	-2.2	+1.2	-1.7		-6.4	-2.6	-0.4	-0.4

Electronic Meters – Follow-up Service

- **Identified Meters out of tolerance**
  - **Three stall with malfunctioning displays**
  - **One stall with air leak**
  - **One with bad wire**
  - **One stall with bad valve**
  - **Three stalls needed electrodes cleaned**

☒ Inspect Take-offs: MANY BAD #1, #6, #10 Replaced AFI Display's
#41 Repllaced Air hose, #29 Retract valve, #47 Remote start wire
#15, #25, #68 cleaned electrodes with RAC, (these units not reading proper milk weight

☒ Inspect Crowd Gate Keystock missing EAST Trolley – Adjusted both track chains
There was Hole in Forward signal hose + Bad 250A Valve for forward
Cylinder hose Union was leaking air and secured one crowd gate wheel

Considerations on Meter Performance Reports

- Low cost
- Frequency – i.e. monthly
- Ease of producer access
- Ease of recording personnel access
- Shorter turnaround and targeted repairs compared to annual water test calibration
- Identify weaknesses in the entire linked milk recording system
- Service opportunity for herd recording organization – build value into recording program
- Ongoing assurance of data validity for use in recording programs

Advantages

- Does not clearly indicate whether a meter is operating within tolerances
  - *Part of the process*
  - *Not the answer or result*
- There is no meter system certification or validation without…
  - *communication*
  - *interpretation*
  - *action*
  - *follow-up*
- Does not replace installation test or routine maintenance

Disadvantages

Common Questions on Testing of AMS (Robot) Herds

1965 - 2015
50 YEARS
NATIONAL DHIA

UOP for Automatic Milking Systems

Data obtained from automatic milking system software may not be used in genetic evaluations unless the system meets National DHIA/Quality Certification Services standards

- Test day milk weights will be obtained as 24-hour yield obtained from the automatic (robotic) milking system software. The average 24-hour milk yield reported should represent a minimum of three consecutive days and not to exceed ten consecutive days.

- Milk samples shall be obtained using National DHIA accepted sampling devices for one of the milkings during the test day. There will be no application of AM/PM factors on milk samples.

DHI Testing of AMS (Robot) Herds

The most common questions are:

- Are the milk weights supervised?
- Is the sampling supervised?

  - Is the yield recording is electronic by an approved device?
    - All milkings are weighed
    - Yes if using the system software and transferring 24-hour weights

  - Is the sampling is automatic by an approved device?
    - Less than all milkings are sampled (usually one milking)
    - Yes - if using an approved shuttle

What Test Plan for Robotic Herds?

Sampling Protocol	Supervised DHI Supervised DHI test conducted by certified field tech/rep		Supervised DHIR Supervised DHI test conducted by certified field tech/rep plus adherence to breed association rules		Unsupervised Dairy producer weighs and samples milk on test day		Supervised Commercial DHI field tech weighs and samples milk, but certain aspects of the uniform operating procedures are not followed	
All milkings weighed & less than all milkings sampled on test day	DHI-APCS	02	DHIR-APCS	22	DHI-OS-APCS	42	DHI-COMM-APCS	72
All milkings weighed, but no samples taken on test day	DHI-MO	33	-----		DHI-OS-MO	43	DHI-COMM-MO	73

LELY

— innovators in agriculture —

- **Approved AMS Models**
  - **Astronaut/Astronaut A2**
  - **Astronaut A3/A3 Next**
  - **Astronaut A4**

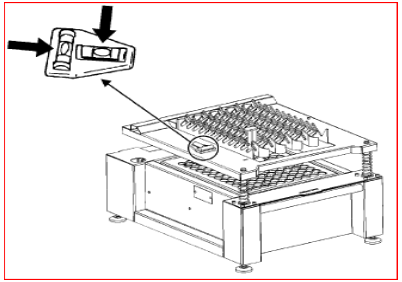
- **Approved Shuttles**
  - **Not all shuttles are approved with all Lely AMS Models**
  - **Lely Shuttle A**
  - **Lely Shuttle XY**
  - **Ori-Collector**

- **Modifications required to use Shuttle XY (handout)**

- **Must provide a calibration report annually to QCS**

Common Challenges with Shuttle A

- Shuttle not leveled
- Tube between shuttle and robot too long
- Shuttle sticky and dirty at arrival
- Shuttle not maintained
- Robot valve too high/low air pressure
- Robot valve not maintained: stuck in dirt.



4.2 Monthly maintenance

4.2.1 Inspection of serrated frame

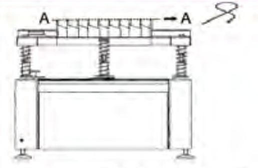


Figure 4.3 Flat serrated frame

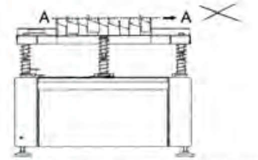


Figure 4.4 Distorted serrated frame

4.2.2 Inspection of float chamber

Check that the float chamber (4, figure 4.5)
Proceed as follows:

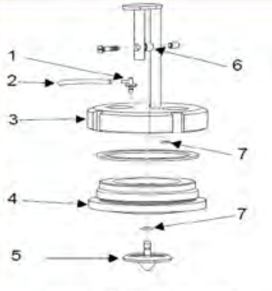
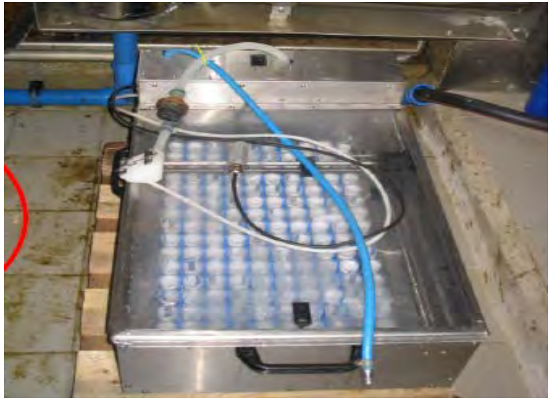


Figure 4.5 Float chamber



DeLaval

- DeLaval VMS
- DeLaval Shuttle for DHI sampling in the USA
- Possible to use Ori-Collector with Adapter Kit and Software Patch when released in USA
- Must provide a calibration report annually to QCS

GEA

- **MIOne AMS System**
- **Must use the MIOne sampler**
- **The Ori-Collector is not approved to work with the MIOne**
- **Must provide a calibration report annually to QCS**

SAYCA
INNOVATION IN FARMING

- Ori-Collector Sampling Shuttle (France)

- Advantages
  - Lightweight
  - Larger Vial Capacity than Shuttle A
  - Approved for Lely A3, A3Next, and A4

- Disadvantages
  - Requires adapter kit and software patch for DeLaval VMS
  - Failed ICAR test for MIOne AMS

- Vial size is part of crown construction – not a stock item ready to go off the shelf

ICAR Approved AMS-Shuttle Combinations

	Shuttle A	Shuttle B	Shuttle XY	VMX Sampler	VMX7 Sampler	GEA Sampler	Ori-Collector
Lely A1	YES	NOT APPROVED	NO				NO
Lely A2	YES	NOT APPROVED	NO				NO
Lely A3	NOT APPROVED	UNDER TEST	YES				YES
Lely A3 Next	NOT APPROVED	UNDER TEST	YES				YES
Lely A4	NOT APPROVED	UNDER TEST	YES				YES
DeLaval VMS				YES	NO		NO
DeLaval VMS 2007				YES	YES		YES
DeLaval VMS 2010					YES		YES
Boumatic MR-S1	NOT APPROVED						NO
Boumatic MR-D1	NOT APPROVED						NO
GEA MIOne						YES	NO

Calibration Report Required Annually

Minnesota DHIA

Minnesota Dairy Herd Improvement Association
307 Brighton Avenue South • Buffalo, MN 55313
(763) 682-1091 • Fax (763) 682-1117 • www.mndhia.org

IN-PLACE ELECTRONIC CALIBRATION REPORT—ROBOTIC SYSTEM

According to the National Dairy Herd Improvement Program, Uniform Operating Procedures, producer-owned electronic meters used for DHIA testing must be checked for accuracy by a qualified technician with the same standards used for DHIA meters if the producer wants information to go to USDA. DHIA information is used by USDA for Sire proofs and other genetic evaluations and is required if the dairy is on a young sire program.

- Calibration reports are required on an annual basis with a maximum interval of 14 months.
- Meters must be within 5% of the Expected reading.

Herd Owner________ Herd Code________ Date________
Farm Name________ Field Rep Name________
Address________ Field Rep Number (We will add)________
City________ State________ Zip________
Robotic Make (Ex Lely)________ Model (Ex A3)________
Install Date (if new install)________ Number of Units________

Robot Serial #________
This Robotic Meter has been calibrated as per dealer instructions and is within certified tolerance: ________
Robot Serial #________
This Robotic Meter has been calibrated as per dealer instructions and is within certified tolerance: ________
Robot Serial #________
This Robotic Meter has been calibrated as per dealer instructions and is within certified tolerance: ________
Robot Serial #________
This Robotic Meter has been calibrated as per dealer instructions and is within certified tolerance: ________
Robot Serial #________
This Robotic Meter has been calibrated as per dealer instructions and is within certified tolerance: ________
Robot Serial #________
This Robotic Meter has been calibrated as per dealer instructions and is within certified tolerance: ________

Signature of person performing test________
Position________
Dealership Name________ City________
Dealership State________ Phone________
Notes or Comments________

PLEASE MAIL TO: MINNESOTA DHIA, 307 BRIGHTON AVE S, BUFFALO MN 55313
or FAX TO MINNESOTA DHIA: (763) 682-1117 attention Gabe.

ARENTSEN FARM SALES & SERVICE INC
6875 Albers Road, Albers, IL 62215
618-248-5005 618-248-5002 fax

33-13-0846
JERRY ARENTSEN

September 10, 2014

To Whom It May Concern:

The Lely A4 Robots at Arentsen Dairy, Serial # 5000613 and Serial # 5000614 were calibrated on September 10, 2014 by our Lely Technician, Patrick Bach.

Sincerely,
Gary Arentsen
Gary Arentsen
President
Arentsen Farm Sales & Service Inc

10/02/2014 07:29 Excel Dairy (FAX)8155634704 P.001/001

EXCEL Dairy Systems, Inc.

Excel Dairy Systems,Inc
145 Stephenson St.
Cedarville, IL 61013
815-563-4703 fax 563-4704

October 2, 2014

To Whomever It May Concern,

The Lely Robots on the Scott Haas Dairy, Elizabeth, Illinois was calibrated on September 30, 2014 by Rick Duchow –L756.

Serial # 50000308
Serial # 50000309

33-41-0029
A4

Sincerely,
Rick Duchow
Rick Duchow
Co Owner

An Alternative to Calibration Report for AMS Systems

Milk Shipped Comparison (ICAR approved in 2014)

Robotic Meter Test Day Bulk Tank Differences

brezzy hill 35561556 14-May 2014

Collection Date	Number of Robots	Collection Time	Actual tank	Tank Volumn	Milk Weight into Tank robot #1	Milk Weight into Tank robot #2	Milk Weight into Tank robot #3	Milk Weight into Tank robot #4	Sum of Daily Milk Weights Measured by the Milk Meter	Deviation %
05/04/14	2			3305	1428	1903			3331	100.79
05/05/14	2			3549	1701	2052			3753	105.75
05/06/14	2			3549	1872	2084			3956	111.47
05/07/14	2			3946	1889	2225			4114	104.26
05/08/14	2			3946	2006	2072			4078	103.35
05/09/14	2			3876	1919	1961			3880	100.10

- Minimum of 3 consecutive days, 5 days give better results
- Deviation must be <u>+</u>3% average over evaluation period
- Spreadsheet template available from QCS
- Cannot use EMMR like PCDART or DC305

CDCB Data Acquisition Service Fee Schedule

Jay Mattison & João Dürr

51st National DHIA Annual Meeting

March 8-10, 2016 – Orlando, Florida

COUNCIL ON DAIRY CATTLE BREEDING

Previously

- NAAB collected assessments for
  - Records in Progress (RIPs)
  - Calving Eases & Stillbirth
  - Conception & Breeding

Totalled about $370,000/year

COUNCIL ON DAIRY CATTLE BREEDING

Transition

- Database & genetic evaluation system moved from AGIL to CDCB
- Data acquisition (payments to DRPCs) also moved from NAAB to CDCB

COUNCIL ON DAIRY CATTLE BREEDING

males represent a large % of CDCB revenue

CDCB Fee Schedule (Updated March 2, 2015)

Rate Code	Participation type	Female fee ($)	Initial male fee ($)		AI service fee for males ($)
1	Total program	0,00	15,00		575,00
2	Member	1,00	22,00		575,00
3	Non-member	3,00	150,00		575,00
			<15 mo	> 15 mo	
4	Canada	6,00	150,00	575,00	575,00
5	Approved partners	7,00	15,00	575,00	575,00
6	All others	7,00	150,00	1200,00	1200,00

Dairy farmer supports it all but division of "the pie"

CDCB Data Acquisition Service Fee Schedule

Data Flow Working Group (DFWG):

- John Clay (DRPC)
- John Meyer (PDCA)
- Chuck Sattler (NAAB)
- Bruce Dokkebakken (DRPs)
- João Dürr (Convener)

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

CDCB Data Acquisition Service Fee Schedule

Scope:

- Since December 2014 the services fees previously paid by NAAB members to the DRPCs have been paid by the CDCB.
- Remunerate phenotypic data suppliers for the additional services associated with the preparation of data for the CDCB cooperator database.
- The aim is to continuously stimulate data suppliers to provide records that meet the editing criteria adopted by CDCB for genetic evaluations.

CDCB Data Acquisition Service Fee Schedule

Criteria for Record Counts:

- Fee per record effectively included in the CDCB genetic evaluations
- Different values for the different record types
- Payments made after each official evaluation date (April, August and December)
- Only records added to the system since the previous run will generate service fee.
- Record completeness also impacts the value per record.

COUNCIL ON DAIRY CATTLE BREEDING

CDCB Data Acquisition Service Fee Schedule

Proposed Remuneration Equation:

Record count categories:	$/rec
Lactation records with valid values for all components (Milk, Fat, Protein, SCS)	0.016
Lactation records with valid values for 3 out of 4 components (Milk, Fat, Protein, SCS)	0.014
Lactation records with valid values for 2 out of 4 components (Milk, Fat, Protein, SCS)	0.012
Lactation records with valid values for 1 out of 4 components (Milk, Fat, Protein, SCS)	0.010
Calving ease records	0.050
Stillbirth records	0.050
Breeding records (cows or heifers)	0.007

Obs. Records containing sire ID but lacking dam ID are discounted by 25%.

COUNCIL ON DAIRY CATTLE BREEDING

CDCB Data Acquisition Service Fee Schedule

New record types:

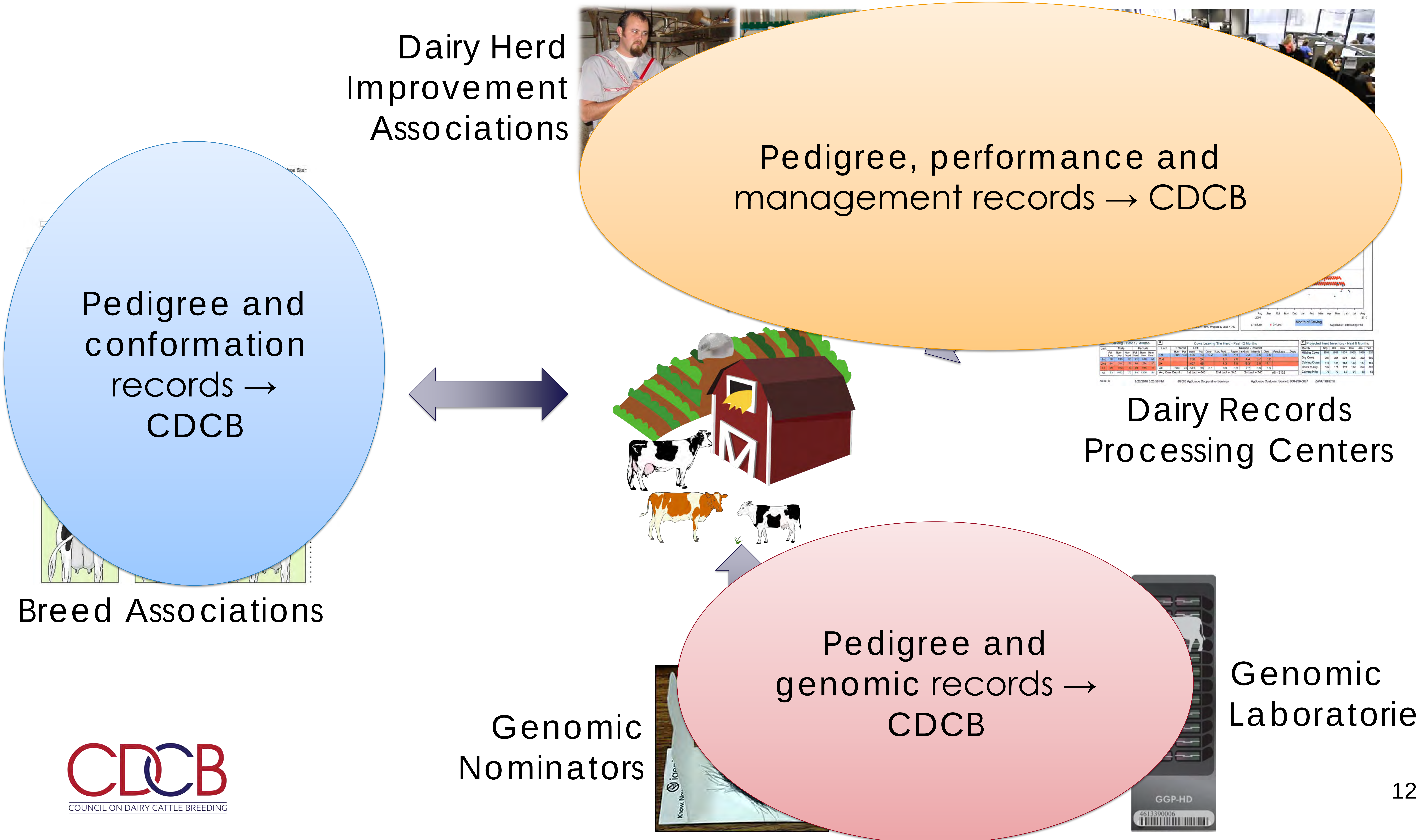
- The remuneration for services associated with new record types to be incorporated into the CDCB database will be done by defining a separate associated fee per record.

Budget for 2016:

- $ 600,000

COUNCIL ON DAIRY CATTLE BREEDING

Opportunities


Dairy Herd Improvement Associations
Pedigree, performance and management records → CDCB
Pedigree and conformation records → CDCB
Dairy Records Processing Centers
Breed Associations
Pedigree and genomic records → CDCB
Genomic Laboratories
Genomic Nominators
GGP-HD
CDCB
COUNCIL ON DAIRY CATTLE BREEDING

Genetic Evaluations for New Traits - Data available at CDCB

- Cow livability
- Heat stress
- Age at first calving
- Interval calving to first insemination
- Persistency
- Gestation length
- Calf livability

COUNCIL ON DAIRY CATTLE BREEDING

Novel traits: Udder health (Egger-Danner et al., 2014)

- Clinical mastitis
- Improved SCC
  - Prolonged elevated SCC
  - Differential cell counts
- Electrical conductivity
- Pathogen information
- Near IR spectroscopy, PCR and IR thermography for detection of mastitis
- Lactoferrin
- Minerals

Novel traits: Reproduction (Egger-Danner et al., 2014)

- Fertility-related diseases (cystic ovaries, retained placenta, metritis, silent heat, etc.)
- Interval from calving to commencement of luteal activity
- Multiple ovulation, ovarian cysts, retained placenta, metritits, silent heat
- Retained placenta, ovary cycle disturbances

Novel traits: Metabolism (Egger-Danner et al., 2014)

- Displaced abomasum
- Ketosis
- Milk fever
- Ratio fat and protein content (first 2 test days)

Novel traits: Feet and legs (Egger-Danner et al., 2014)

- Lameness
- Disorders based on veterinarian diagnoses
- Disorders based on data from hoof trimming data

COUNCIL ON DAIRY CATTLE BREEDING

Other novel traits (Egger-Danner et al., 2014)

- General temperament, aggressiveness, milking temperament
- Suckling behaviour
- Milkability from automated milking systems (AMS)
- Behaviour traits from AMS
- Activity data
- Fatty acids (spectral data)
- Feed efficiency
- Residual Feed Intake
- Methane emissions

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

Genetic Evaluations for Novel Traits

- Data pipeline:
  - Who is the driver?
  - What needs to be recorded and how it should be done?
  - What is the value added?
  - Business model
- Data quality:
  - Standards
  - QC
  - Branding
- R&D:
  - AGIL
  - Universities
  - Funding
- Data flow:
  - Ownership
  - Incentives
  - Data protection
- Services implementation:
  - Validation
  - Communication
  - Implementation

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

Summary:

- CDCB is moving ahead as planned
- CDCB's revenue model likely to be stable over the next years
- CDCB Data Acquisition Service Fee Schedule in place
- Novel traits:
  - Data already available
  - New data pipelines

COUNCIL ON DAIRY CATTLE BREEDING

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

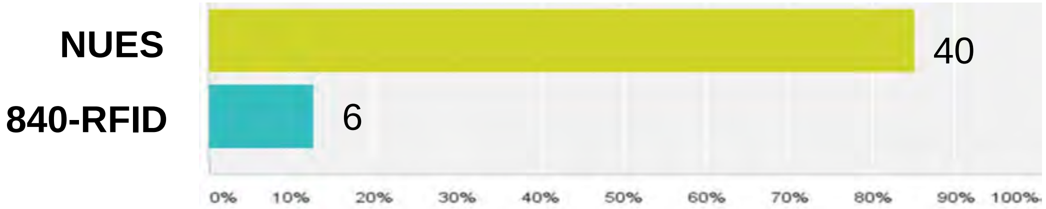
On the Front Line

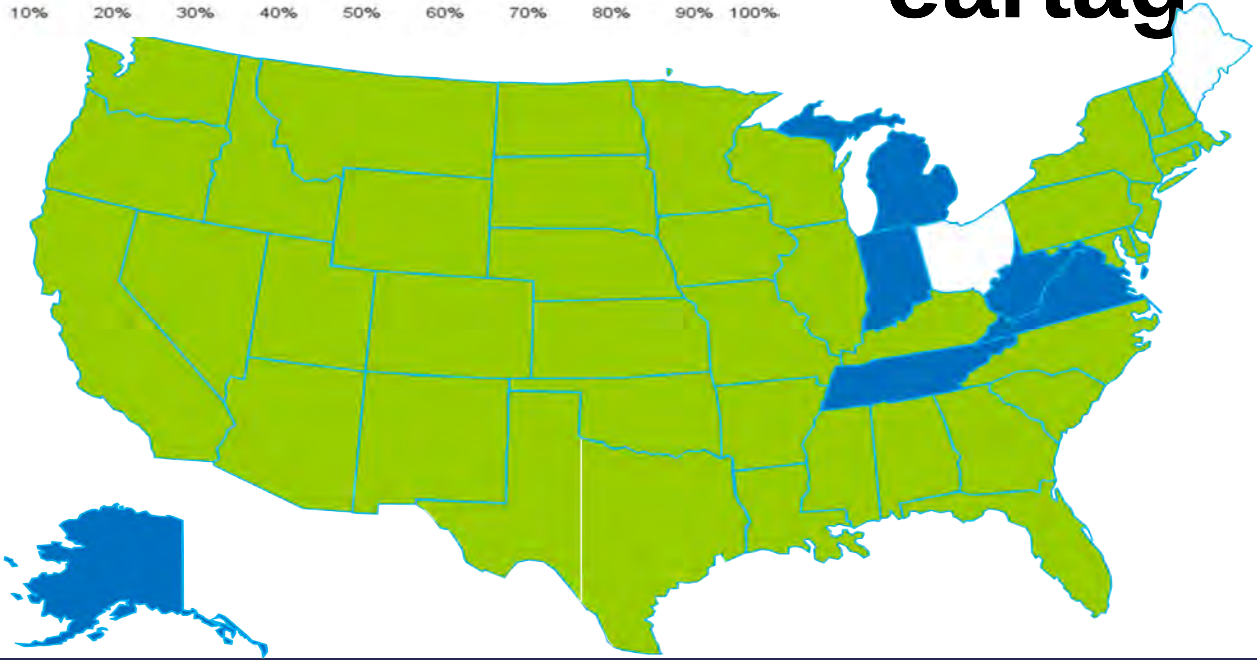
Jay Mattison
CEO, Quality Certification Services, Inc.
National DHIA

Observations

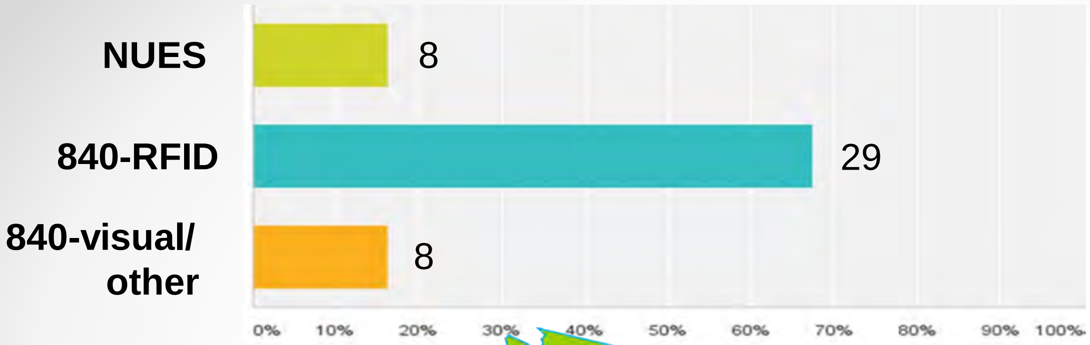
- **ID issues are huge overhead on the system**
  - **Getting errors and omissions fixed takes labor at many points**
  - **Hard for the dairy farm to understand why because a “nobbed” system**
  - ***DHI field service is placed in a difficult position***

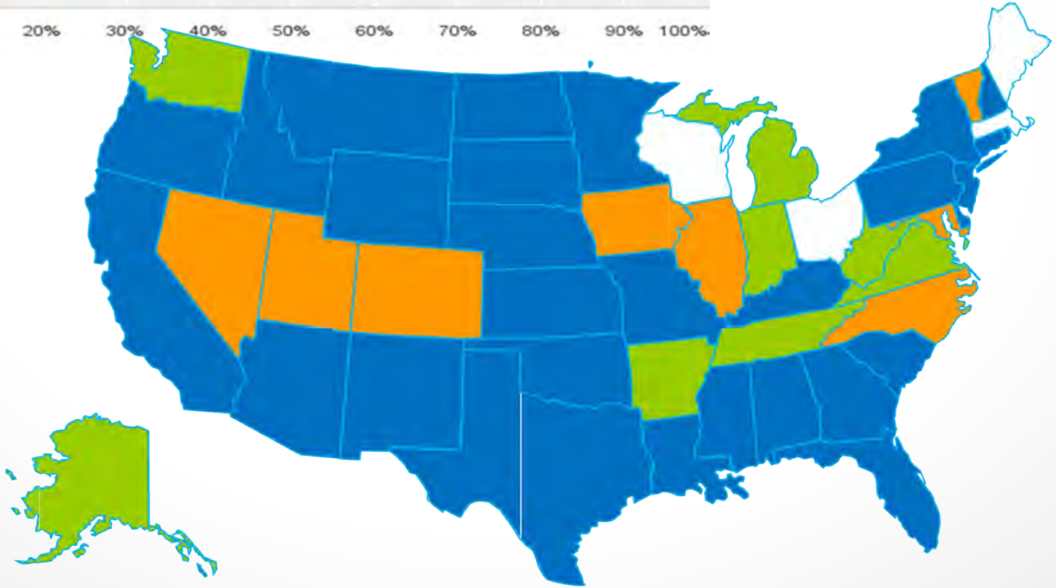
Primary eartag



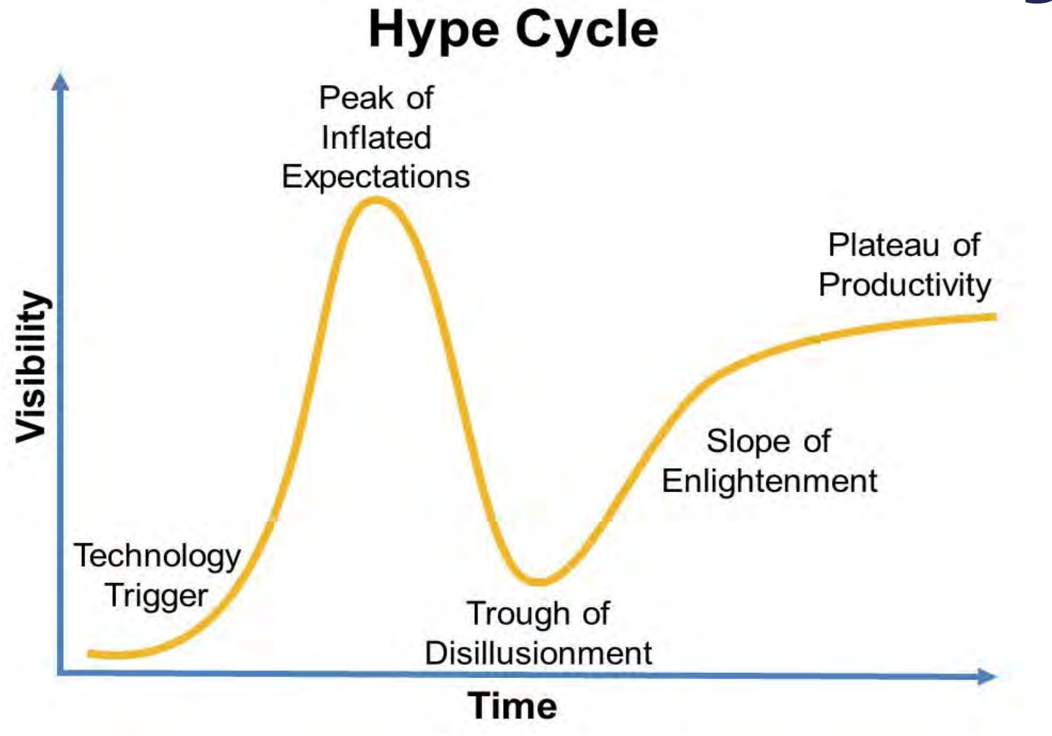


Secondary eartag





Innovation of technology



Observations

- **Research and Innovation**
  - **Innovation and research**
  - **Research and innovation**
  - ***Innovation and research***
  - ***Dairy farms and milk support it all!!!***

Capital investment – how to best spread and deliver innovation

Observations

- Some examples
  - AMS (robotic) challenges
    - Establish a technical group
    - Earn a seat or position with Canadians/Germans
  - Milk recording devices
  - Universal Samplers

Capital investment – how to best spread and deliver innovation

Observations

- Some examples
  - MIR
    - *What is it?*
    - *Status*

Capital investment – how to best spread and deliver innovation

www.optimir.eu

OptiMIR

2011 - 2015

Investing in Opportunities

This project has received European Regional Development Funding through INTERREG IV B.

nwe

INTERREG IVB

Innovation on Milk Recording

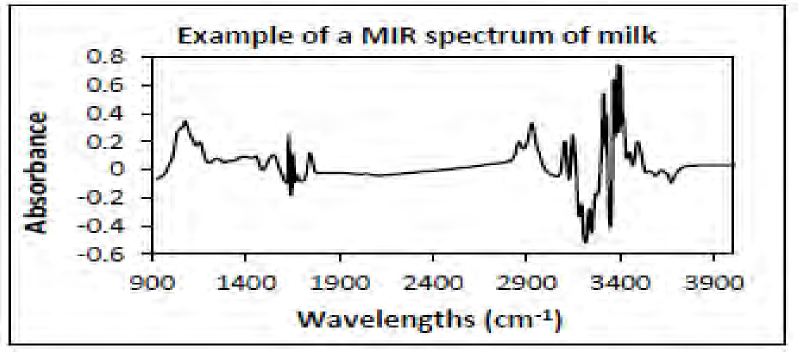
New Management Indicators

Decision Making and Profitability

Pregnancy, Embryo loss, Ketosis, Acidosis, Methane, Energy Balance...

Milk recording and Mid Infrared spectrometry

MIR spectrum for each cow



MILK RECORDING DATA

Fat
Proteins
Cells
Urea

Observations

- **Some examples**
  - ***Data Handlers***
  - ***Data Collection***
  - ***Delivery of Information***

Capital investment – how to best spread and deliver innovation

Observations

Providing solutions and innovation for dairy producers

Igenity Dairy Heifer Program

For DHIA

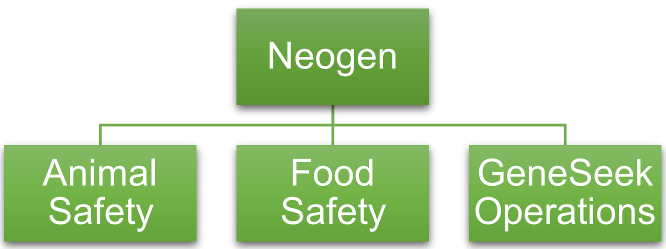
Introduction to GeneSeek and Igenity Products

51st National DHIA Annual Meeting

March 8, 2016

Who is Neogen?

- 1000+ employees
- Forbes Magazine – 200 Best Small Companies in America
- NASDQ: NEOG



Neogen CEO, Jim Herbert

Global Presence

+ Representation in
>100 Countries

GeneSeek Operations

- 30,000 sq. ft. (2800 sq. meters) lab based in Lincoln, NE- USA
- World's leading commercial agricultural genomics lab
- > 130 Scientists and Technicians around the globe
- Providing Fast, Accurate, Affordable DNA based services for agribusiness and R&D since 1998
- Igenity branded products for end user genomic applications

NEOGEN

Business partners

GeneSeek and Igenity History

- **1998**: GeneSeek founded by Dr. Abe Oommen and Dr. Daniel Pomp from UN-Lincoln
- **2003**: Merial launches Igenity profile for dairy
- **2010**: GeneSeek acquired by Neogen Corporation
- **2012**: Neogen acquires Igenity from Merial.
- **2014**: Igenity Dairy Heifer Program is launched.

History of dairy genomics

- L1 Dominette 01449, the Hereford subject of the Bovine Genome Project
- More than 300 scientists, 25 countries six years of effort
- Published in *Science* on April 24, 2009

- Dominette's genetic material will be re-genotyped at USDA-MARC to correct errors and anomalies in the original project
- The process will be faster, less costly and more accurate

NEOGEN

Current state of technology

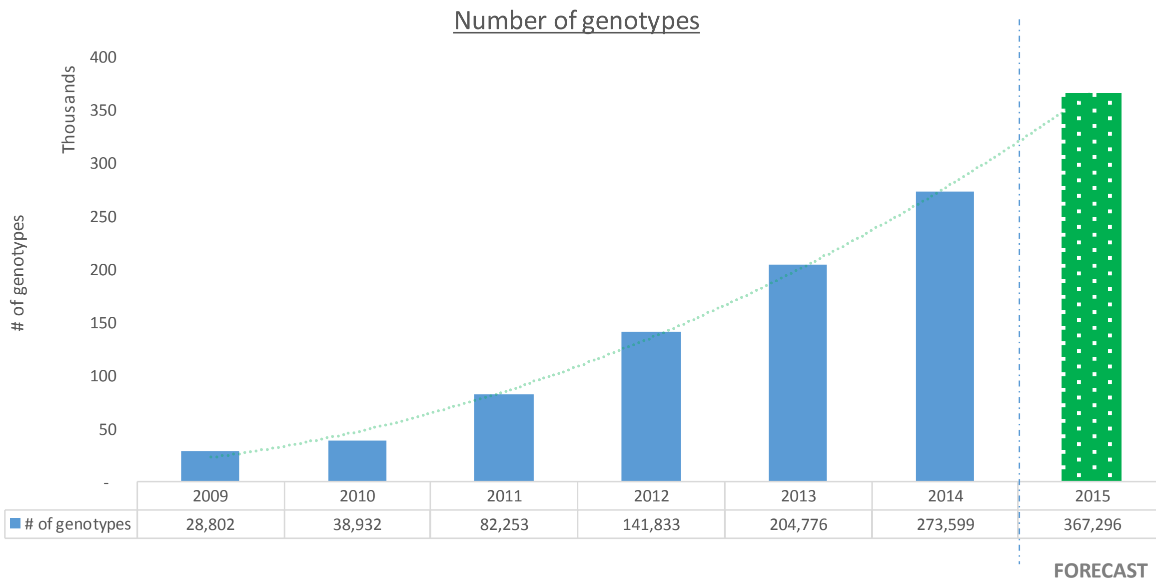
Fast-forward to 2016…..

Producers are using DNA testing and dairy genomics for:

- Diagnosis and screening for genetic health issues
- Selection, breeding, herd improvement and management decisions
- When buying or selling breeding stock and commercial cattle

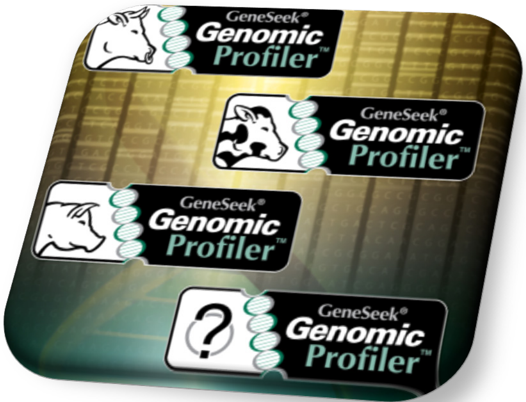
Genomic evolution

- Over 1,000,000 samples submitted
- Shift from registered to commercial



	2009	2010	2011	2012	2013	2014	2015
# of genotypes	28,802	38,932	82,253	141,833	204,776	273,599	367,296

GeneSeek Genotyping BeadChips



GGP Dairy and Beef low density – 42k SNPs
GGP Dairy and Beef high density – 150k SNPs
GGP F-250 Functional Variant chip -250K SNPs
GGP *indicus* LD and HD – 20k and 80k SNPs
GGP Porcine low density – 9k SNPs
GGP Porcine high density – 70k SNPs
Horse – 74k SNPs
MegaMUGA (Mouse)– 80k SNPs
GIGAMuga (Mouse) – 150K SNPs
Eucalyptus – 60k SNPs
Sheep low density – 12k SNPs

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GeneSeek – A Global Leader

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AREAS OF INTEREST TECHNIQUES SYSTEMS PRODUCTS & SERVICES INFORMATICS SCIENTIFIC CONTENT COMPANY SUPPORT SEARCH

Products / **GeneSeek GGP Whole-Genome Genotyping Arrays**

GGP Whole-Genome Genotyping Arrays

Overview

Interested in receiving newsletters, case studies, and information on new applications? Enter your email address below.

* **First Name:** Marg

* **Last Name:** Mueller

* **Email:** mmueller@illumina.com

* **Area of Interest:** Select...

Sign Up

REQUEST PRICING QUESTIONS

GeneSeek GGP Whole-Genome Genotyping Arrays

GENESEEK Genomic Profiler

Illumina offers GeneSeek® Genomic Profiler (GGP) genotyping array products for non-human organisms through a co-agreement with Neogen®.

These specialty whole-genome arrays enable accurate genotyping to understand the impact of genetics in selection, breeding, and managing livestock and model organisms. Find ready-to-use solutions with a variety of densities for bovine, porcine, mouse, and equine.

GGP Bovine Arrays

GGP Bovine 150K Array: GGP Bovine 150K leverages Illumina array technology and bovine base content with GeneSeek custom content for this genome-wide bovine genotyping array, featuring over 134,000 SNPs, for *Bos taurus* breeds.

GGP *Bos Indicus* HD Array: GGP *Bos Indicus* HD leverages Illumina array technology and bovine base content with GeneSeek custom content for this genome-wide bovine genotyping array, featuring over 74,000 SNPs, for *Bos indicus* breeds.

GGP Bovine LD Array: GGP Bovine LD leverages Illumina array technology and bovine base content with GeneSeek custom content for this genome-wide bovine genotyping array, featuring over 26,000 SNPs, for *Bos indicus* and *Bos taurus* breeds.

GGP Porcine Arrays

GGP Porcine HD Array: GGP Porcine HD leverages Illumina array technology and porcine base content with GeneSeek custom content for this genome-wide porcine genotyping array, featuring over 70,000 SNPs, for all major porcine breeds

NEOGEN®

Igenity advantages

TRUSTED LEADER.
Neogen's GeneSeek laboratory is the world's largest, most innovative animal genomics laboratory.

ELITE TECHNOLOGY.
Our chips include custom content for highly accurate prediction. Igenity-Essential is the only product on the market today that is an alternative to the USDA-CDCB dairy evaluation.

QUALITY ADD-ON CONTENT.
By offering BVD and Y SNP testing in addition to genomic testing, you know more with just one sample.

VALUE.
With products under $30, Igenity has the best products for cost-conscious producers.

QUICK TURN AROUND TIME.
Time is money and we strive to get every sample through our lab in 14 days.

SUPERIOR SUPPORT.
Programs like Igenity Dashboard and personal assistance from the Neogen customer service team are there to help you every step of the way.

NEOGEN®

Igenity genomic solutions

Igenity-Select

Traits include:

Key Traits
- Parentage verification
- Net merit
- Milk yield
- Fat (lbs.)
- Protein (lbs.)
- Somatic cell score
- Productive life (months)
- Daughter pregnancy rate
- Daughter calving ease*
- Igenity performance index (IPI)
- Grazing Merit
- Final score (PTAT)
- Genomic future inbreeding

Fertility Traits
- Sire caving ease*
- Heifer conception rate
- Cow conception rate
- Daughter stillbirth*
- Sire stillbirth*
- Haplotype status

Yield Traits
- Fat (%)
- Protein (%)
- Cheese merit
- Fluid merit

Type Traits
- Feet/legs composite*
- Udder composite*
- Stature
- Strength
- Body depth*
- Dairy form
- Rump angle
- Thurl width
- Rear legs side view
- Rear legs rear view*
- Foot angle
- Feet and leg score*
- Fore udder attachment
- Rear udder attachment
- Rear udder height
- Udder cleft
- Udder depth
- Front teat placement
- Rear teat placement*
- Teat length

Genetic Conditions
- Coat color (including black/red)*
- Dominant red coat color*
- Haplotype polled
- Haplotype brachyspina*
- Haplotype CVM*
- HCD*
- BLAD*
- DUMPS*
- Mulefoot*

Add-ons
- BVD diagnostic testing
- Y SNP testing

Igenity-Prime

Includes all the traits listed above plus:

- Kappa casein
- Beta casein
- Beta lactoglobulin

Add-ons:

- A2 Beta Casein
- Brachyspina
- CVM
- Horned/polled

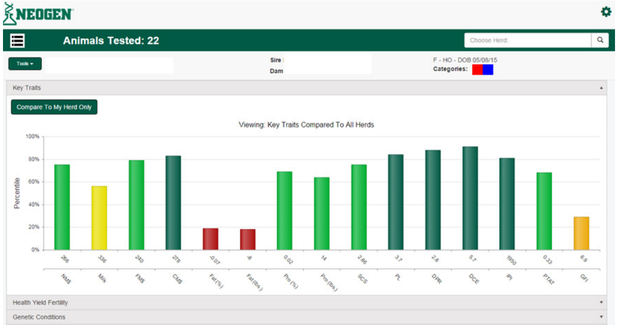
BVD Diagnostic Testing

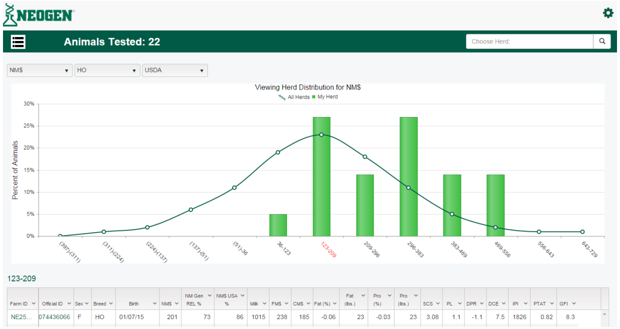
- Available for all animals tested.
- Can be run using the same sample submitted for genetic testing.
- Ensures you are only paying to test animals most likely to become a superior females.

Development of innovative tools

- User-friendly interface to view genomic results
- Mobile-friendly for easy use on tablets and phones
- Allows users to sort, filter and rank heifers
- Ability to graph and visualize end-user data
- Capacity to allow consultants and other third-party entities view data

Igenity Dashboard





NEOGEN

The future with GeneSeek

- **GGP-F250**
  - Functional gene variant genotyping chip for beef and dairy cattle
  - Discover mechanisms for traits difficult to measure phenotypically such as reproductive loss, disease resistance and feed efficiency

- **Sequencing**
  - Custom solutions that can adapt to changing market
  - High volume, low-cost alternative to chip-based solutions

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CORPORATION

CDCB Report

João Dürr & Duane Norman

51st National DHIA Annual Meeting

March 8-10, 2016 – Orlando, Florida

COUNCIL ON DAIRY CATTLE BREEDING

CDCB Core Value:

Providing Premier Dairy Genetic Information Services & Industry Collaboration

CDCB
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Dairy Records Providers

- **Jay Mattison, *Chair***
  National DHIA
- **Kent Buttars**
  Rocky Mountain DHIA
- **Dan Sheldon**
  DairyOne

National Association of Animal Breeders

- **Gordon A. Doak, *Vice Chair***
  NAAB
- **Nate Zwald**
  Alta Genetics
- **Charles Sattler**
  Select Sires, Inc.

Dairy Records Processing Centers

- **John Clay, *Secretary***
  Dairy Records Management Systems
- **Patrick Baier**
  AgSource Cooperative Services
- **Ted Foster**
  Dairy Records Management Systems

Purebred Dairy Cattle Association

- **Neal Smith, *Treasurer***
  AJCA-NAJ
- **Gordie Cook**
  Holstein Association USA, Inc.
- **John M. Meyer**
  Holstein Association USA, Inc.

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

Non-voting Advisory Members of the CDCB Board of Directors - 2016 (1 year term)

Douglas Ricke
Zoetis

Juan Tricarico
Innovation Center for U.S. Dairy

Non-members Supporting the CDCB Board of Directors

George Wiggans
ARS-USDA Industry Liaison
Animal Genomics and Improvement Laboratory

Jack Gravelle
CDCB Attorney
Porter Wright Morris & Arthur LLP

João Dürr
CDCB Chief Executive Officer

Duane Norman
CDCB Technical Advisor and Industry Liaison

COUNCIL ON DAIRY CATTLE BREEDING

CDCB Key Objective for 2015 Delivered

Transferring the genetic evaluation system,

data editing and industry cooperator

database from USDA-AGIL to CDCB

hardware and operational control

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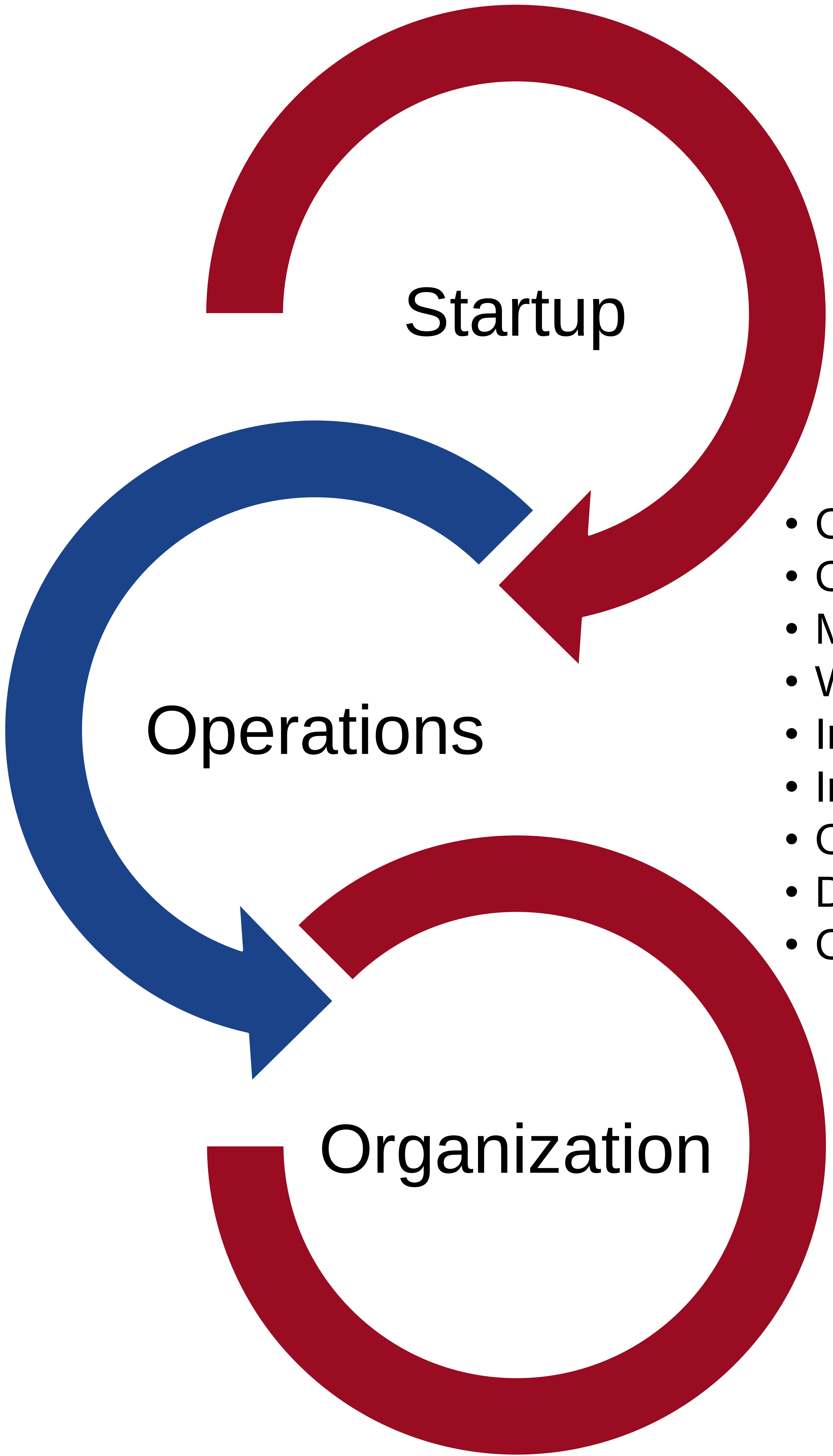
COUNCIL ON DAIRY CATTLE BREEDING



- Key qualified staff
- Finances
- Internet presence & tools
- Office space
- Hardware + software
- Human resources policies
- Legal
- Transfer DB & Software to CDCB servers

- Cooperator database
- Official evaluations
- Monthly genomic evaluations
- Weekly genomic predictions
- Interim evaluations
- Interbull evaluations
- Online queries
- DHI reports
- Customer support

- Material License Agreements
- Board of Directors policies
- Quality control
- Working groups
- Strategic plan
- Branding

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

CDCB 2015

- Transfer of Operations
  - Significant process and required the efforts of the AGIL and CDCB staffs to complete.
  - Testing was started in mid-summer 2015 with parallel operation taking place in October and November 2015 with final stand-alone deployment in November and December.
- Material license agreements (MLAs)
  - Finalized with all data providers in June 2015 and signed by December 2015 (>30)
  - Non-funded Cooperative Agreement with USDA-ARS.

CDCB Fee Schedule (Updated March 2, 2015)

Rate Code	Participation type	Female fee ($)	Initial male fee ($)		AI service fee for males ($)
1	Total program	0,00		15,00	575,00
2	Member	1,00		22,00	575,00
3	Non-member	3,00		150,00	575,00
			<15 mo	> 15 mo	
4	Canada	6,00	150,00	575,00	575,00
5	Approved partners	7,00	15,00	575,00	575,00
6	All others	7,00	150,00	1200,00	1200,00

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CDCB Data Acquisition Service Fee Schedule

Criteria for Record Counts:

- Fee per record effectively included in the CDCB genetic evaluations
- Different values for the different record types
- Payments made after each official evaluation date (April, August and December)
- Only records added to the system since the previous run will generate service fee.
- Record completeness also impacts the value per record.

COUNCIL ON DAIRY CATTLE BREEDING

CDCB Data Acquisition Service Fee Schedule

Proposed Remuneration Equation:

Record count categories:	$/rec
Lactation records with valid values for all components (Milk, Fat, Protein, SCS)	0.016
Lactation records with valid values for 3 out of 4 components (Milk, Fat, Protein, SCS)	0.014
Lactation records with valid values for 2 out of 4 components (Milk, Fat, Protein, SCS)	0.012
Lactation records with valid values for 1 out of 4 components (Milk, Fat, Protein, SCS)	0.010
Calving ease records	0.050
Stillbirth records	0.050
Breeding records (cows or heifers)	0.007

Obs. Records containing sire ID but lacking dam ID are discounted by 25%.

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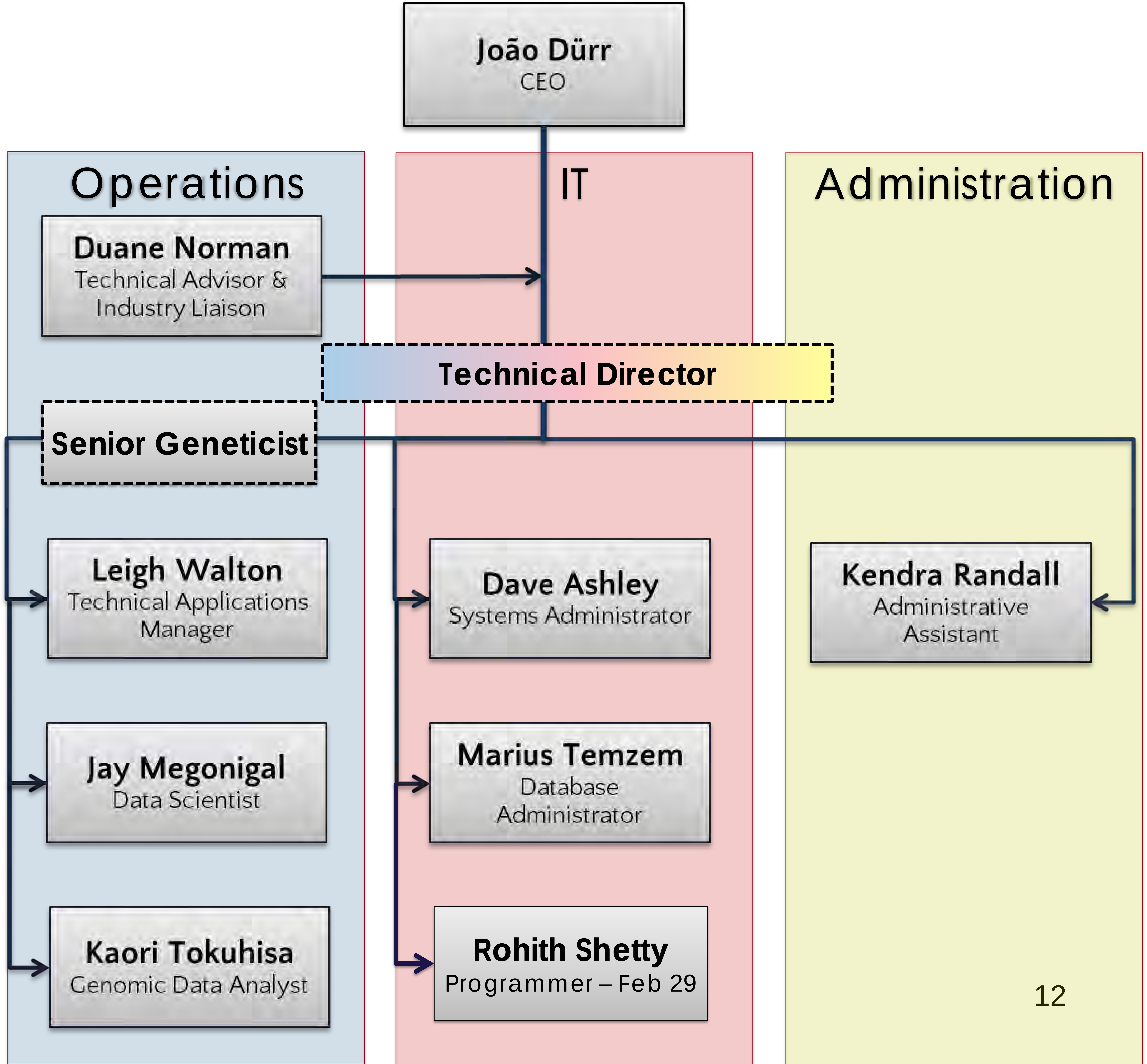
CDCB 2015

- In July 2015, the industry cooperator database surpassed genotypes for 1 million animals.
- Predictions of genetic merit are made available to the industry 55 times per year.

CDCB Staff

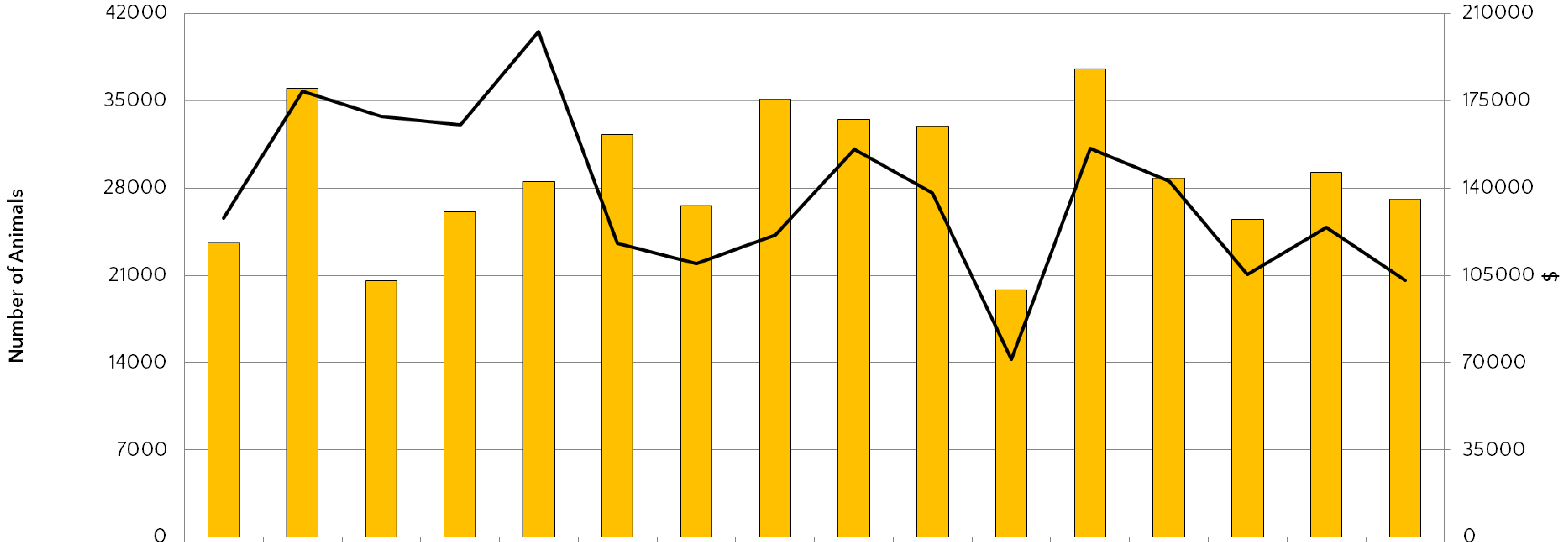


COUNCIL ON DAIRY CATTLE BREEDING

Industry Outreach

- Industry meeting
  - September 2015 in Middleton, WI, in association with World Dairy Expo
  - > 130 attendants
  - Progress reports: CDCB, AGIL, Interbull Steering Committee
  - “Status of Dairy Cattle Breeding Research in the U.S.”
  - “One Million Genotypes: How Genomics Re-Shaped the Dairy Industry”
- A joint meeting between representatives of both Boards of Directors was held with the Canadian Dairy Network in Toronto, ON, Canada, in April 2015 to discuss a common agenda and develop further cooperation between countries.
- CDCB sponsored the Interbull/ADSA-ASAS Joint Annual Meeting symposium (Use of Genomics To Improve Limited and Novel Phenotypes in Animal Breeding) held in July 2015 in Orlando, FL.

CDCB Initial Fees



	1411	1412	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1601	1602
Genotypes	23616	35976	20548	26093	28524	32298	26565	35150	33473	32994	19849	37572	28785	25473	29236	27134
Initial Fees ($)	127894	178675	168730	165482	202822	117698	109749	121317	155451	137950	71288	155841	142906	105351	124290	103024

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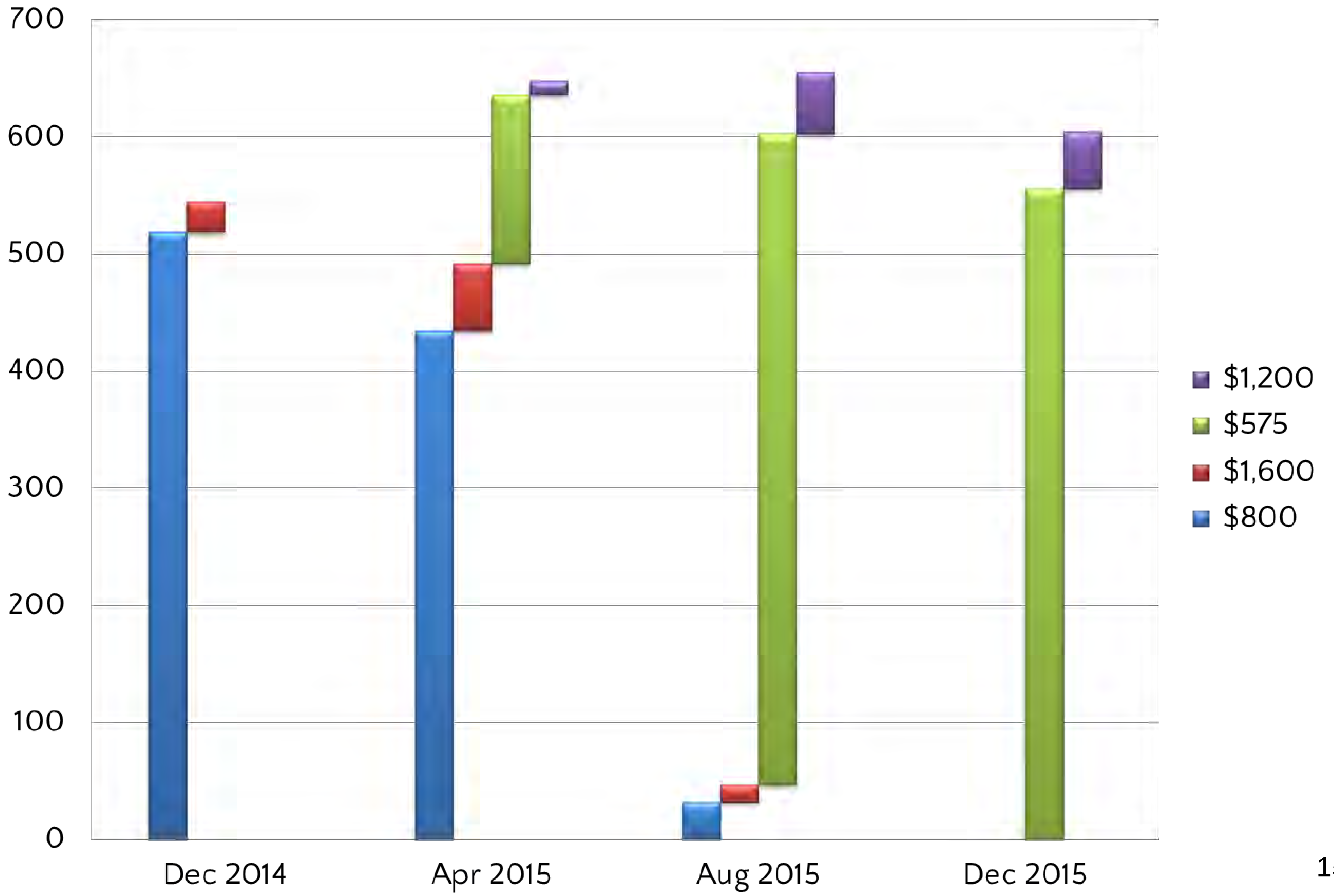
COUNCIL ON DAIRY CATTLE BREEDING

Number of Bulls paying CDCB AI Fees



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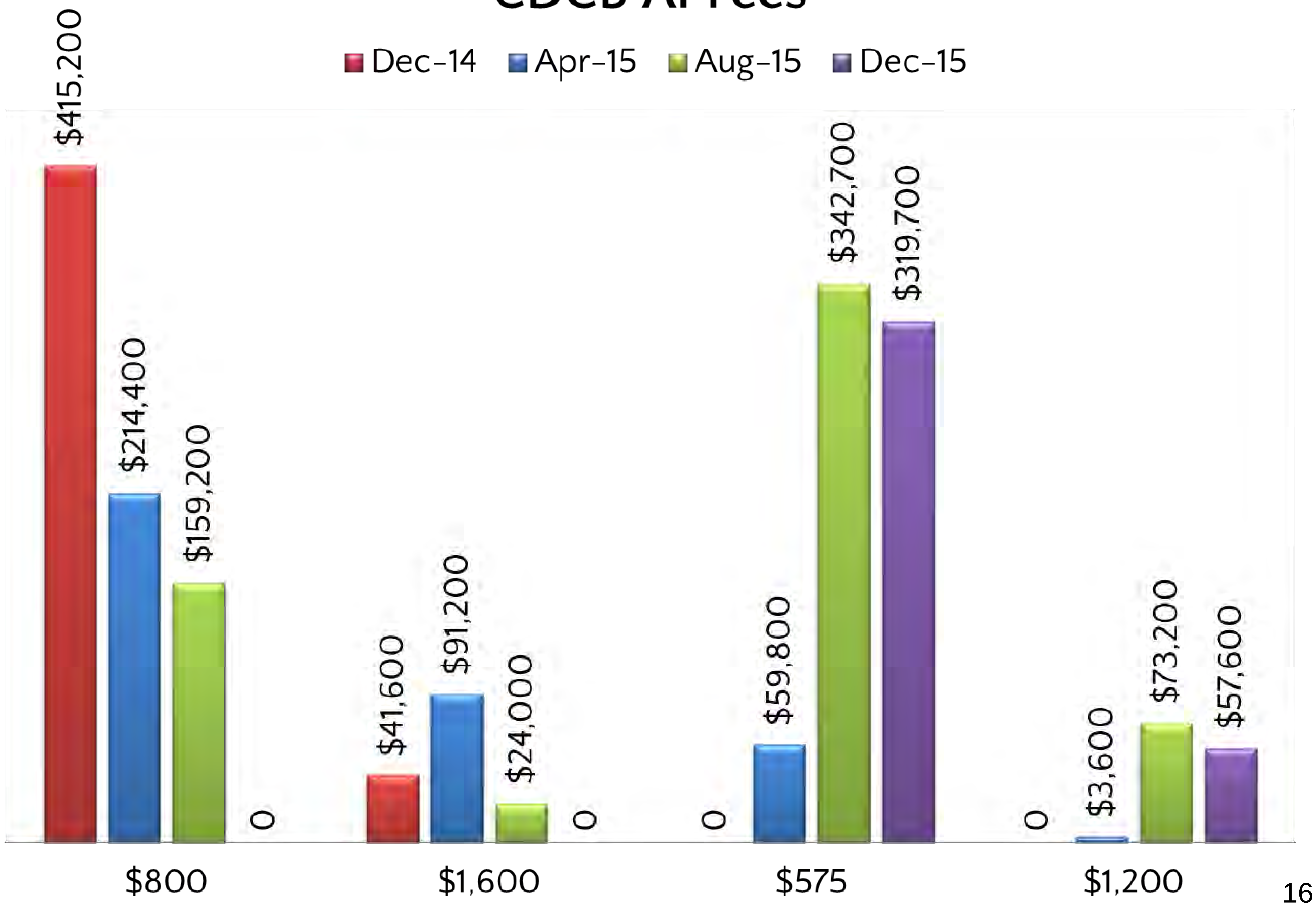
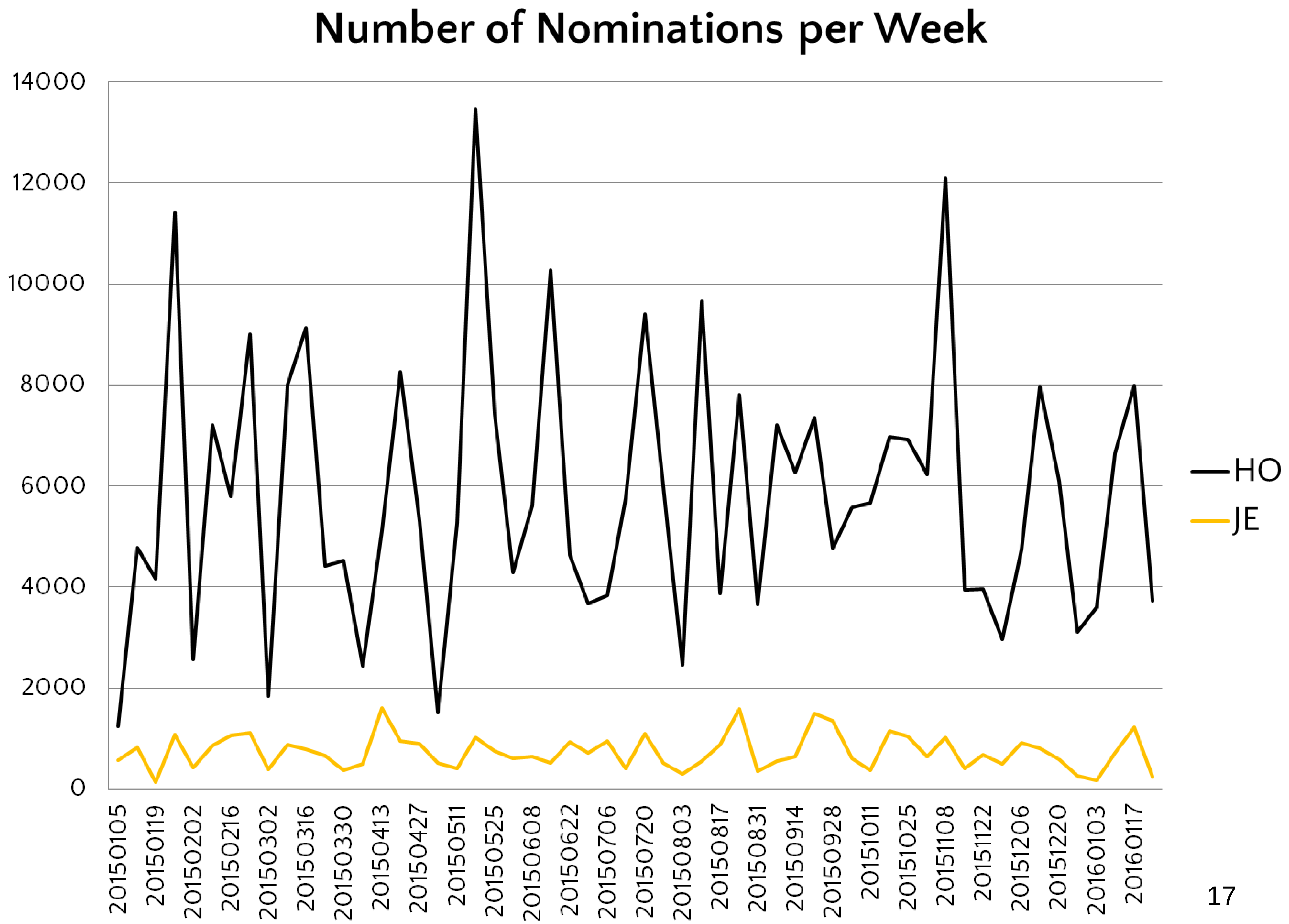
CDCB AI Fees



COUNCIL ON DAIRY CATTLE BREEDING



COUNCIL ON DAIRY CATTLE BREEDING

Summary

- The 2015 operational year of CDCB activity showed great progress and had a positive impact on the industry and dairy farmers. There is still much work to do, but cooperation seems to be the intent of many individuals and organizations to get the system in place for the benefit of the U.S. dairy farmer. It has been pleasure meeting and working with all the different people during 2015.

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COUNCIL ON DAIRY CATTLE BREEDING

Thank You!

www.cdcb.us

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

CDCB Report

João Dürr & Duane Norman

51st National DHIA Annual Meeting

March 8-10, 2016 – Orlando, Florida

COUNCIL ON DAIRY CATTLE BREEDING

Evaluation Changes since Last Year's NDHIA Meeting

- April 2015:
  - Sire conception rate and calving traits for all bulls
  - Brown Swiss haplotype for polled
  - Productive life standard deviation
- August 2015:
  - Holstein haplotype for cholesterol deficiency (HCD)

COUNCIL ON DAIRY CATTLE BREEDING

Evaluation Changes since Last Year's NDHIA Meeting

- December 2015:
  - Genetic variance for Jersey type traits (correction)
  - Unknown parent group definitions
  - Additional breeds from Interbull
  - Editing changes for sire conception rate
  - Transition from Animal Improvement Programs to CDCB by the Effective Date

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COUNCIL ON DAIRY CATTLE BREEDING

Evaluation Changes since Last Year's NDHIA Meeting

- April 2016: Coming next month
  - Genomic evaluation of Guernseys
  - Edit for heifer conception rate (HCR)
- May 2016: Probably finalized in 2 months
  - Breed Base Representation (BBR) for crossbreds
- August 2016: Possibly an additional evaluation trait
  - Cow Livability

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COUNCIL ON DAIRY CATTLE BREEDING

Breed Base Representation (BBR)

INTRODUCTION:

- DNA can reveals ID of sires 99% of the time, grandsires 97%.
- DNA can identify the breeds that produced the crossbreds.
- AIP developed a method to reveal the breeds that produced any crossbred

COUNCIL ON DAIRY CATTLE BREEDING

BBR: HOW IS THIS DONE?

- Purebred reference groups formed using registered AI bulls of 5 U.S. breeds.
  - (Bulls with multiple breeds in their recorded pedigree excluded).
- Procedure checks similarity of DNA in 5 reference groups to each animal genotyped.
- BBR percents (sum to 100%) can reveal outcross bloodlines or crossbreeding.
  - Deciding which of these 2 is sometimes difficult.
- Exact percentages of breed sources not possible because animals vary.
  - True contribution from various breed often differs from estimated BBR percentages (sometimes by 5% or more).

REASONS PRODUCERS MIGHT WANT TO KNOW BBR

- Many want animals whose ancestors are all of the same breed.
- Some want bulls that will give them a specific multi-breed composition, to capitalize on heterosis.
- Others want to transform their herd to an alternate breed.

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BBR: EXAMPLE 1

The BBRs for 2 outcross animals; i.e., animals somewhat isolated from the current North American population:

	% Breed AY	% Breed BS	% Breed GU	% Breed HO	% Breed JE
U-OF-MN Holstein	3	1	1	93	2
Danish Jersey cow	1	0	2	1	96

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BBR: EXAMPLE 2

The BBRs from 2 first-generation crossbreds; i.e., animals resulting from mating purebreds of 2 different breeds:

	% Breed A	% Breed B	% Breed C	% Breed D	% Breed E
Animal 3	0	48	0	52	0
Animal 4	1	0	51	47	1

COUNCIL ON DAIRY CATTLE BREEDING

BBR: EXAMPLE 3

The BBRs from 2 animals resulting from initiating a rotational crossing system; i.e., animals resulting from crossing F1s with a third breed:

	% Breed A	% Breed B	% Breed C	% Breed D	% Breed E
Animal 7	23	52	24	0	1
Animal 8	28	0	24	48	0

CDCB
COUNCIL ON DAIRY CATTLE BREEDING

BBR CONCLUSIONS

- BBR is great at revealing DNA from various breeds when the breed contributes a significant portion of DNA.
- However, caution is needed as the percents provided can vary by 5% or more from what's expected.
- BBR will improve the genetic predictions for crossbreds in the future.

COUNCIL ON DAIRY CATTLE BREEDING

ICAR
Subcommittee Interbull

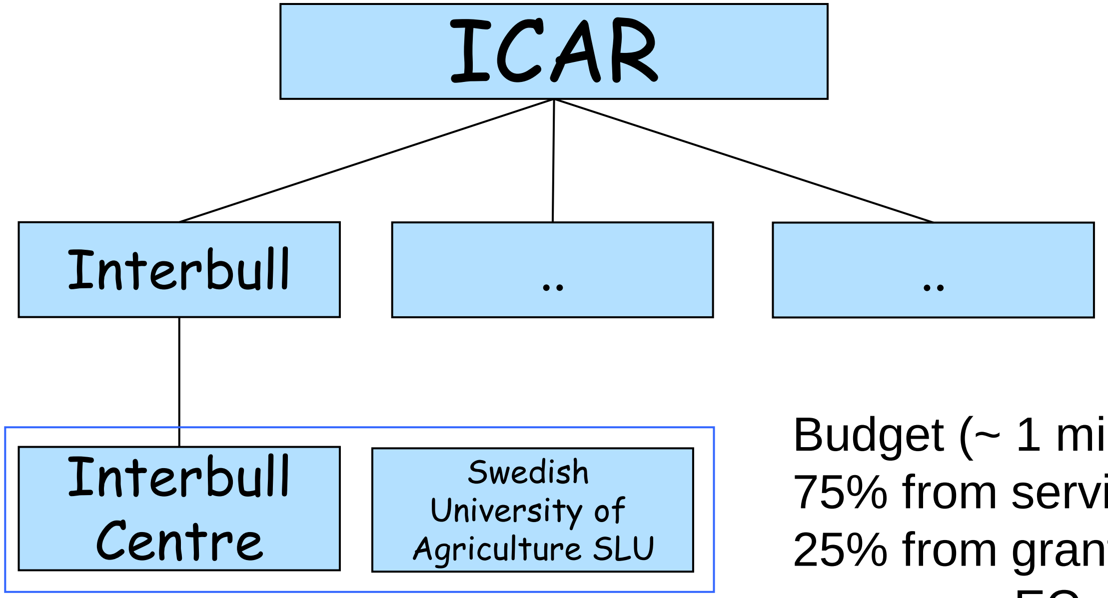
NDHIA meeting Orlando, March 8-10, 2016

Reinhard Reents

- Chairman of the Interbull Steering Committee
- CEO IT Solutions for Animal Production, vit, Germany

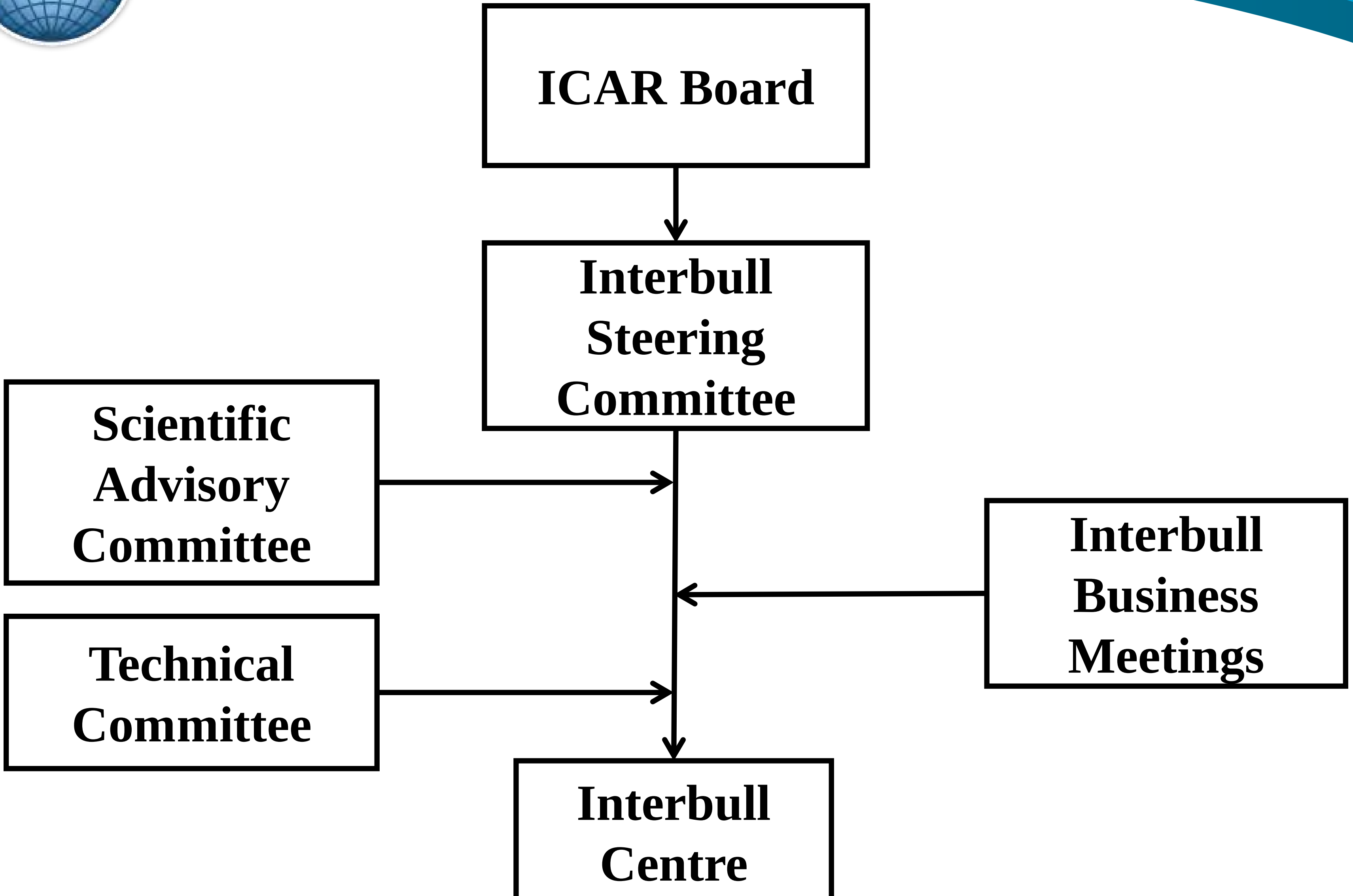
Interbull - ICAR

- 1983 Interbull Committee founded by IDF, EAAP and ICAR 1982
  → make genetic merit of dairy bulls comparable
- 1988 Interbull permanent subcommittee of ICAR with its own Steering Committee



Budget (~ 1 mio EUR):
75% from service fees
25% from grants
- EC, SLU
- ...

Operational structure



Main Interbull Acivities

Networking → Meetings, Workshops, Seminars

- 2015 JAM US +EAAP in Warsaw
- 2016 ICAR, Chile + EAAP in Belfast
- 2017 EAAP, Estonia + ADSA (?)
- 2018 ICAR NewZealand,
- 2019 ADSA,

- Services
  - Validation
  - MACE
  - GMACE
  - Intergenomics
  - Interbeef

- Standard setting → ICAR guidelines for genetic evaluation

- Publications

Interbull Centre in Uppsala

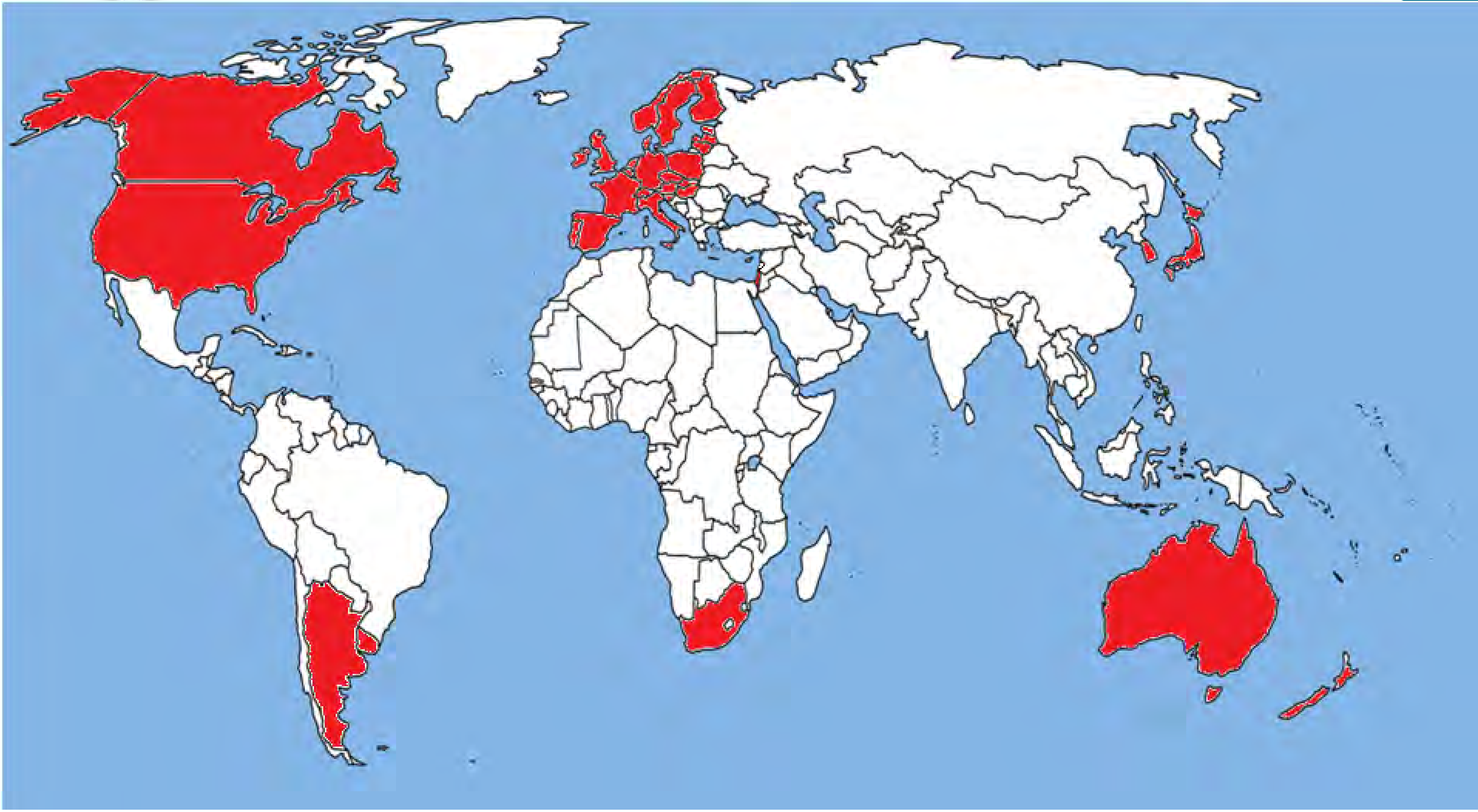
- Toine Roozen started September 2015 as Interbull Centre Director and replaced Joao Dürr

- EU Reference Lab
  - Since 1996
  - Renewed for 2016 and 2017
- ISO 9001:2008 certified

Portfolio of Interbull → traits, services

1995	Production										
1999	Production	Type									
2001	Production	Type	Udder health								
2004	Production	Type	Udder health	Longevity							
2005	Production	Type	Udder health	Longevity	Calving						
2007	Production	Type	Udder health	Longevity	Calving	Fertility					
2008	Production	Type	Udder health	Longevity	Calving	Fertility	Workability				
2010	Production	Type	Udder health	Longevity	Calving	Fertility	Workability	GEBV-test			
2011	Production	Type	Udder health	Longevity	Calving	Fertility	Workability	GEBV-test	InterGeno mics		
2014	Production	Type	Udder health	Longevity	Calving	Fertility	Workability	GEBV-test	InterGeno mics	GMACE	
2015	Production	Type	Udder health	Longevity	Calving	Fertility	Workability	GEBV-test	InterGeno mics	GMACE	Beef

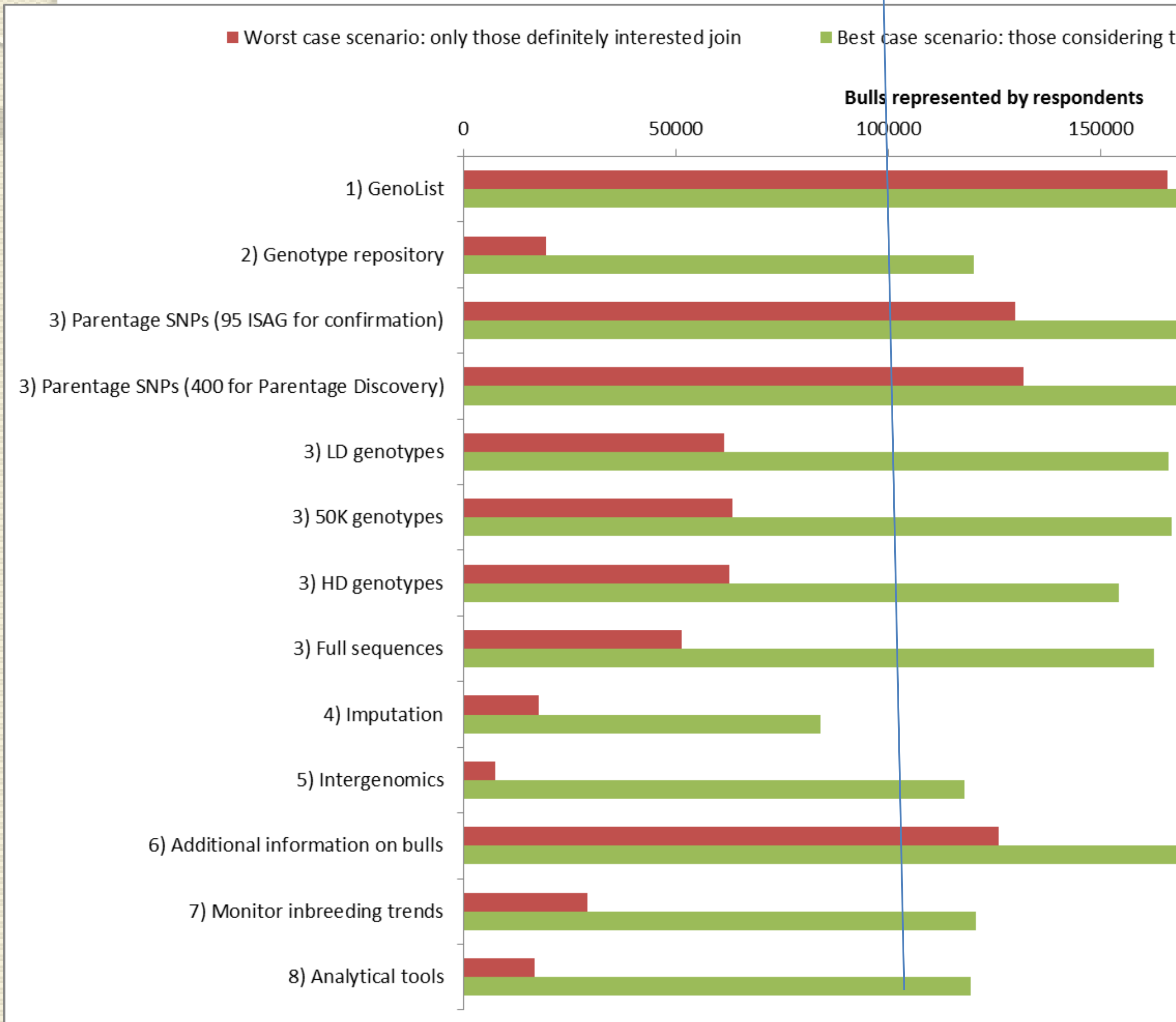
Interbull Customers



Populations in MACE (April 2015)

Breed Group	Production (3)	Conformation (23)	Udder Health (2)	Longevity (1)	Calving (4)	Female Fertility (5)	Workability (2)	TOTAL (40)	Number of publishable proofs (production)
Brown Swiss	11	9	10	10	5	9	6	**60**	10 242
Guernsey	6	4	6	6	0	6	0	**28**	1 079
Holstein	31	24	29	20	15	19	10	**148**	139 799
Jersey	11	9	8	9	0	5	5	**47**	11 479
Red Dairy Cattle	14	9	13	10	7	11	6	**70**	14 800
Simmental	12	0	11	5	0	0	0	**28**	28 823
TOTAL	**85**	**55**	**77**	**60**	**27**	**50**	**27**	**381**	**206 222**

Genomic data in Interbull – potential demand from survey



GenoList

Parentage
- verification and
- discovery

Additional Information
- genetic recessives
- …

International **Genotype Exchange** Platform

- Infrastructure at Interbull Centre
- BC|SNPmax, by Biocomputing Platforms:

1. Parentage SNP Exchange (PSE)
   - Launch October 2016
2. Genomic Data Exchange (GDE)
3. Customised Genomic Repository (CGR)

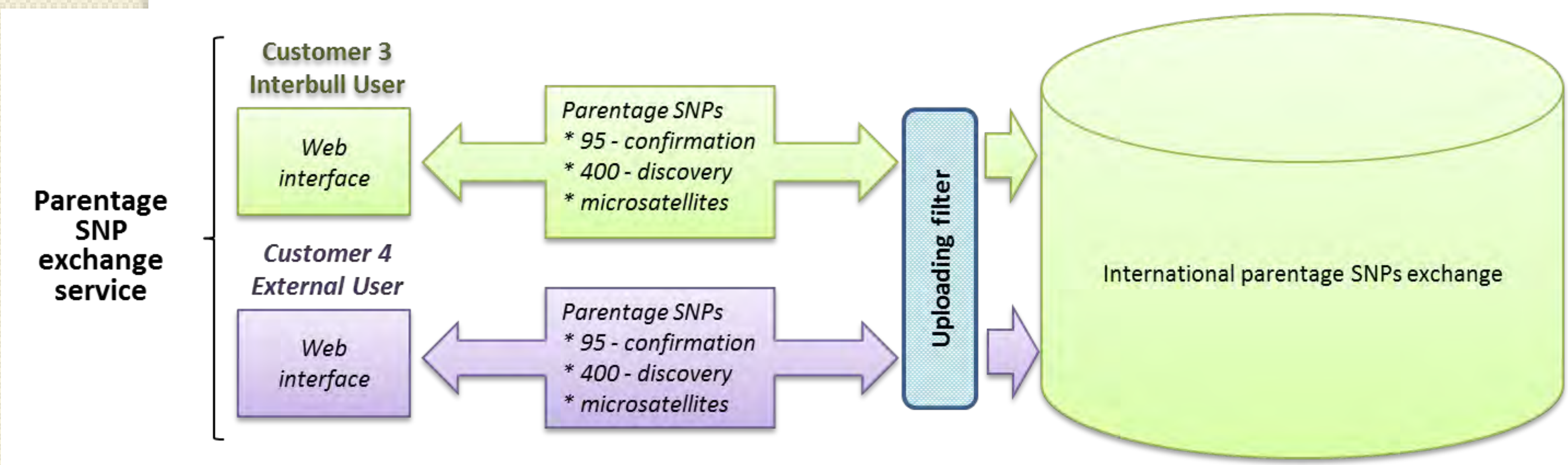
GENOEX
International Genotype Exchange Platform

GENOEX PSE (Parentage SNP Exchange)

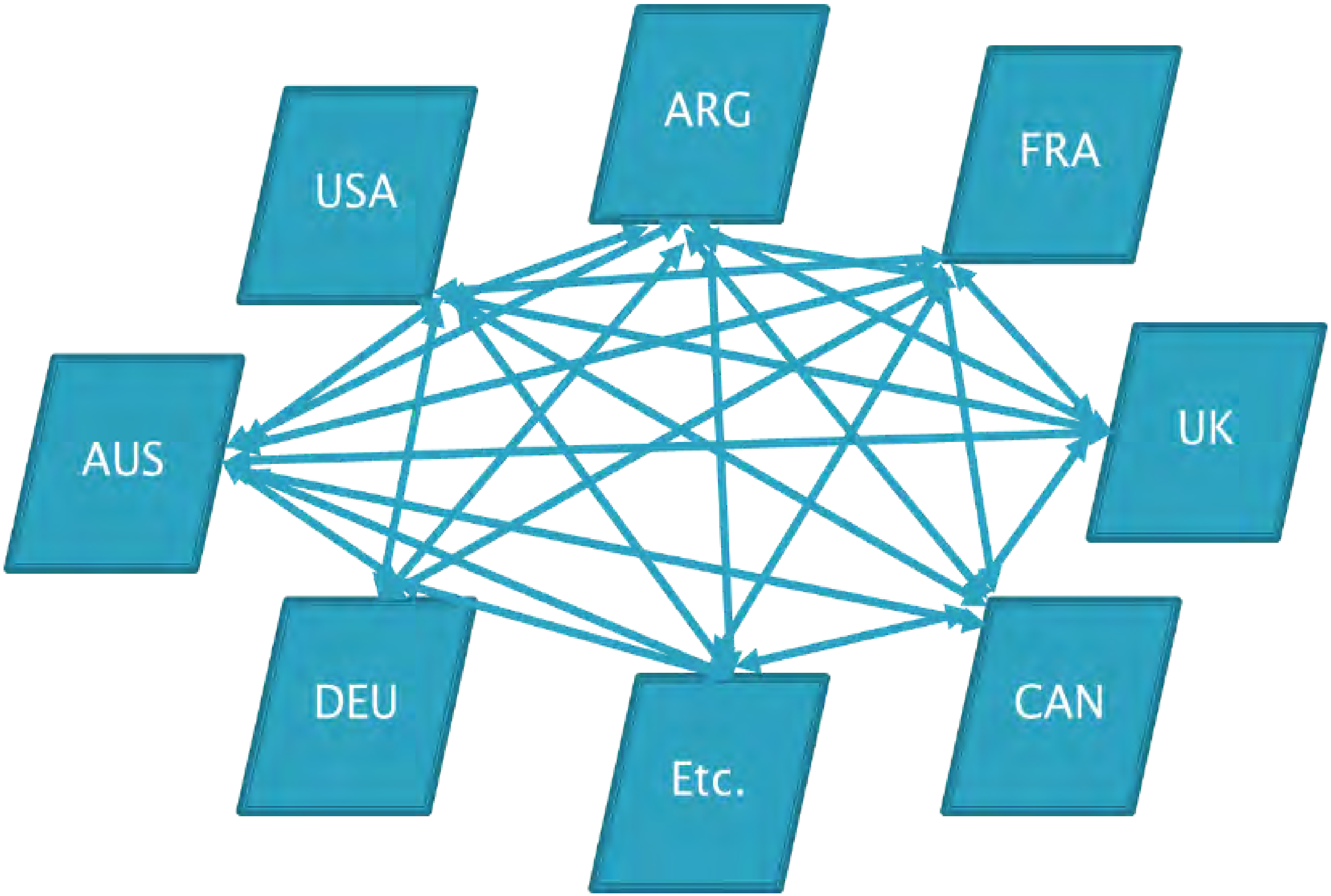
- PSE Data types
  - Parentage confirmation SNPs (~100)
  - Parentage discovery SNPs (~400)
  - Parentage confirmation microsatellite markers

- Business model
  - Participation voluntary
  - Initial investment by SLU and ICAR
  - PSE service provide through (annual) fees
  - Operating on not-for-profit basis

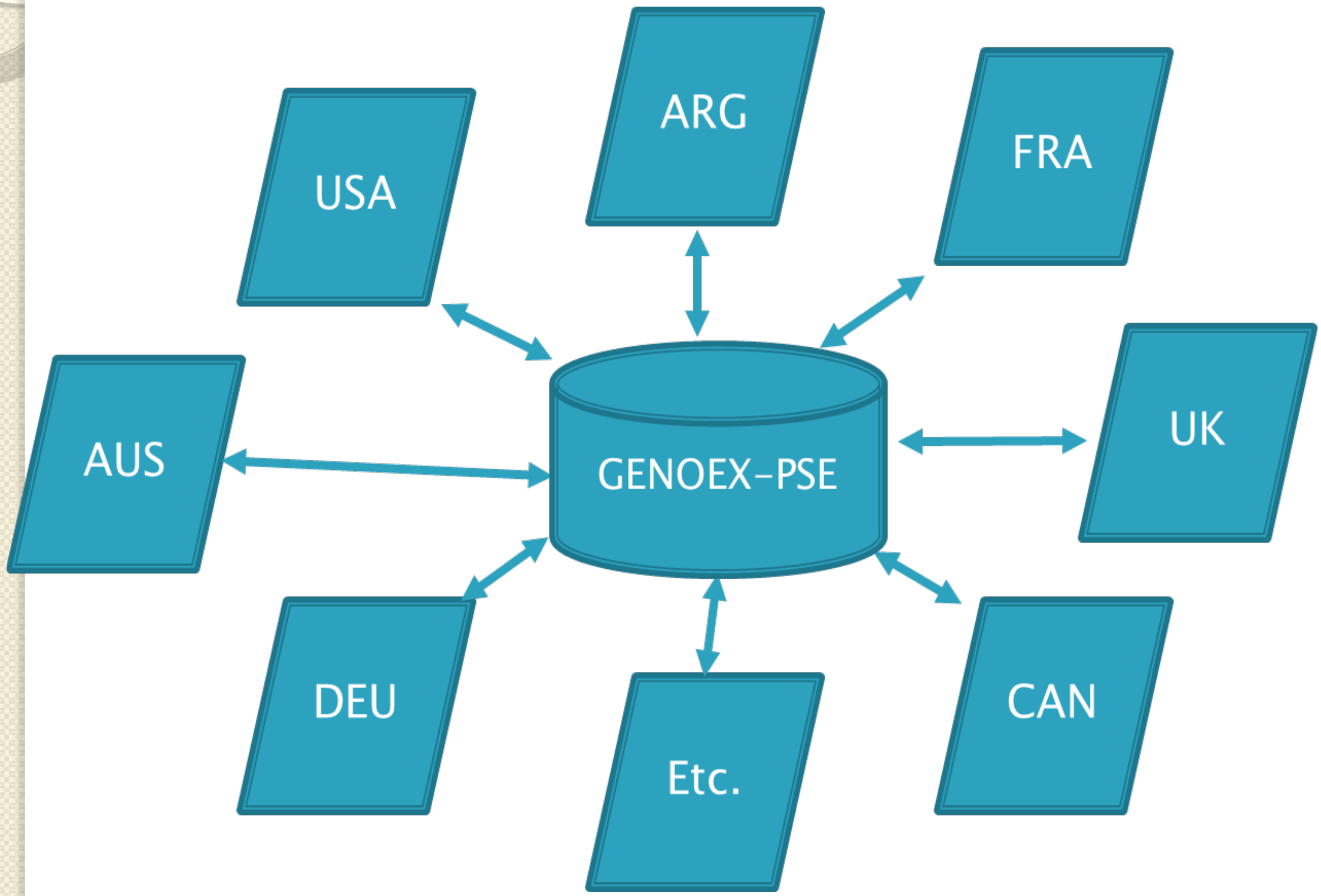
Parentage SNP exchange service (PSE)



Before GENOEX – PSE



With GENOEX – PSE



Thank You !

Your Interbull Team

Proposed service categories

- Parentage SNP exchange service (PSE)
- Genomic data exchange service (GDE)
- Customized genomic repository service (CGR)

PSE Data types

- Parentage confirmation SNPs (~100)
- Parentage discovery SNPs (~400)
- Parentage confirmation microsatellite markers

GenoEX

- Infrastructure for International Genotype Exchange Platform
- 2012 Interbull Survey

1. Parentage SNP Exchange Service (PSE)
2. Genomic Data Exchange Service (GDE)
3. Customised Genomic Repository Service (CGR)

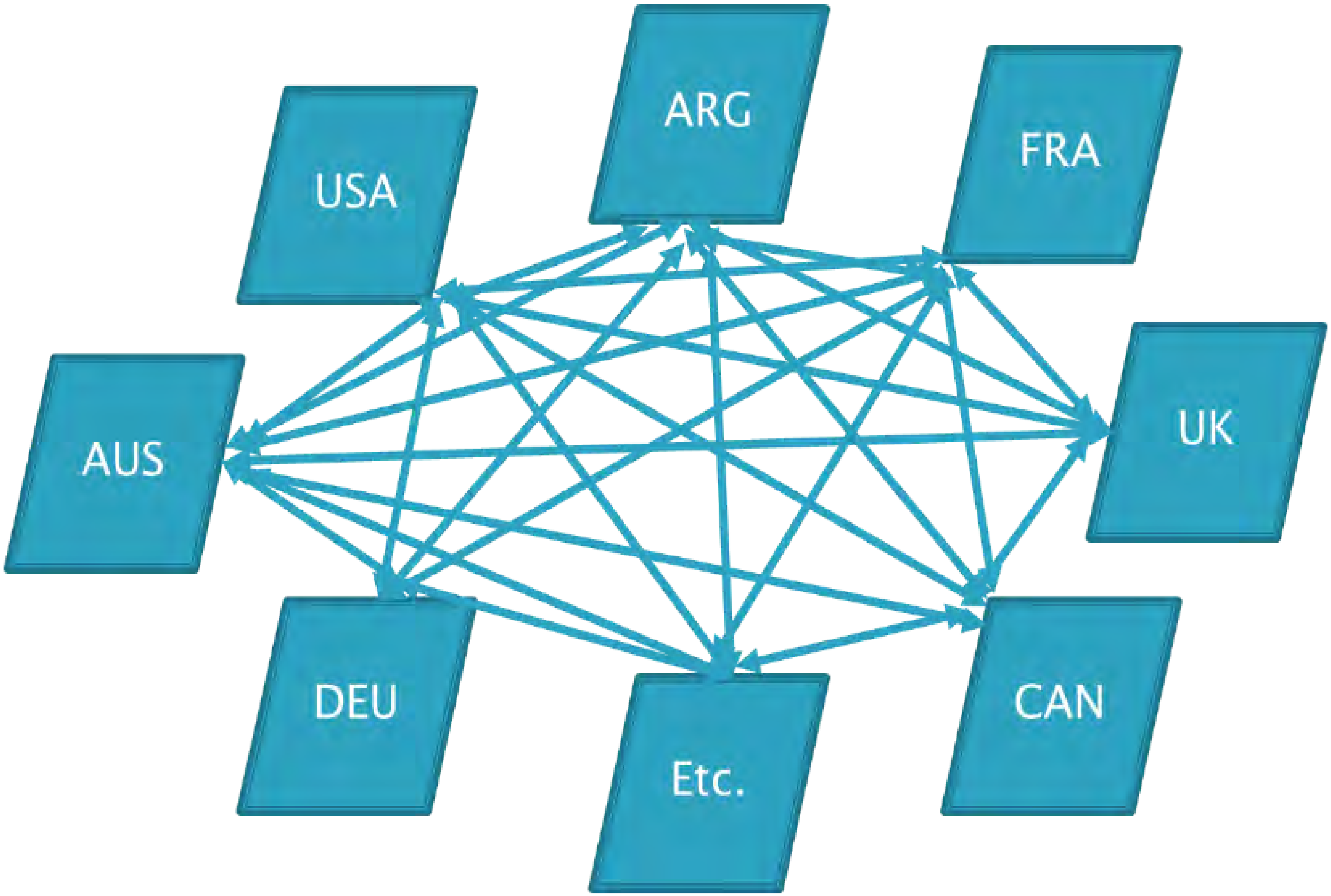
GenoEx-PSE users

- Interbull service users
- ICAR member users
  - Organization that is an associate or full member of ICAR or represents a full member of ICAR and that is responsible for official parentage verification services in its own coverage area

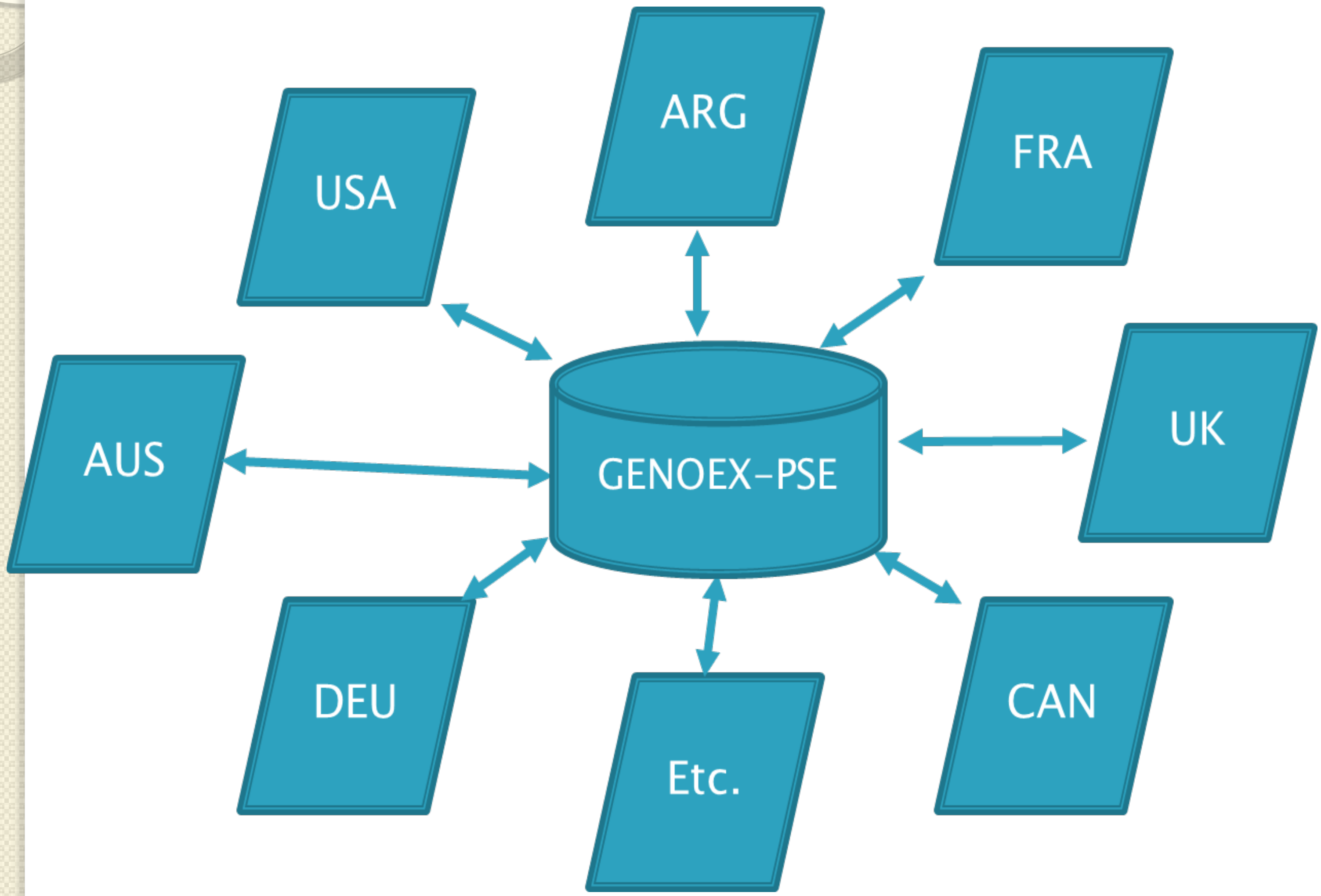
GenoEx-PSE Expert Group

- Brian Van Doormaal – Chair Canadian Dairy Network (CDN), (Interbull SC)
- Hossein Jorjani – Secretary Interbull Centre
- Matthew McClure Irish Cattle Breeding Federation, (Parentage Recording WG)
- George Wiggans Animal Genomics and Improvement Laboratory, USA (Parentage Recording WG)
- Louise Marguin Institut de l'Élevage, France (nominated by Interbull SC)
- Romy Morrin-O'Donnell Weatherbys DNA Laboratory (Genetic Analysis WG)
- Tom Lawlor Holstein USA (Breed Association WG (Dairy)
- Johnny Mackay Aberdeen Angus Cattle Society, (Breed Association WG & Interbeef)

Before GENOEX – PSE



After GENOEX – PSE



Thank You !

Your Interbull Team

GENOEX-PSE Implementation Task Force

1. Sophie Mattalia, Interbull Steering Committee
2. Suzanne Harding, ICAR Parentage Recording WG
3. Wim van Haeringen, ICAR Genetic Analysis WG
4. Matthew Shaffer, ICAR Breed Associations WG
5. Andrew Cromie, ICAR Interbeef WG
6. Secretary: Brian Van Doormaal, Interbull Steering Committee
7. Convener: Toine Roozen, Interbull Centre Director

STRATEGIC PLANNING INTERBULL

(2016)

Strategic planning

Vision/Mission

Interbull: The worldwide network providing genetic information services for improvement of livestock.

- Developed in 2009. Did not change in 2013.

Planning overview

- Interbull vision
  - Alignment with ICAR's vision
- Mission
  - Interbull's role under the ICAR umbrella
- **S**trengths, **W**eaknesses, **O**pportunities, **T**hreats
- Key strategic areas
  - specific focus on 'strategy into action' during 2016 and 2017.

2. Guiding Principles.

- Our fundamental, norms & values.

Ranking	Guiding Principles
1	Customer oriented
2	Accurate / Unbiased
3	Independent / Impartial
4	Transparent
5	Cost effective

Strategy Headlines

'Mini Task Forces' to work on development of:

- MACE and Validation
- Customer service orientation and new traits
- SNP-based International evaluations

Strategic Plan

- The outputs of the meeting will be documented in a draft Interbull Strategic Plan, which will be circulated for consultation amongst Interbull Service Users during 2016.
- The final plan will be presented during the Interbull Business Meeting on 24 October 2016 in Puerto Varas, Chile.

Relationsship ICAR <-> Interbull

- ICAR duties
  - Standards / publications etc. (board and GA)
  - Services and operations of other Subcommittees
    - Service ICAR → mainly in contracting a service provider (examples ID testing, ..)
  - ICAR has to work on this structure because these activities rely heavily on the Chair and members of these SC (all volunteers)

PERSONNEL IB CENTRE

Interbull Centre

- Erling Strandber
- Toine Roozen (From 09'15)
- Hossein Jorjani (acting dir.)
- Eva Hjerpe
- Valentina Palucci
- Carl Wasserman
- Mohammad A. Nilforooshan
- Petri Pennanen
- **Joanna Sendecka (Jan 2015)**
- **Haifa Benhajali (Mar 2015)**

Staff that left

- João Dürr (in September '14)
- Jette Jakobsen (January 2013)
- Anne Loberg (PhD student)
- Dan Englund (retired)
- Gerald Jansen (consultant, contract ended)

Duties at Interbull centre

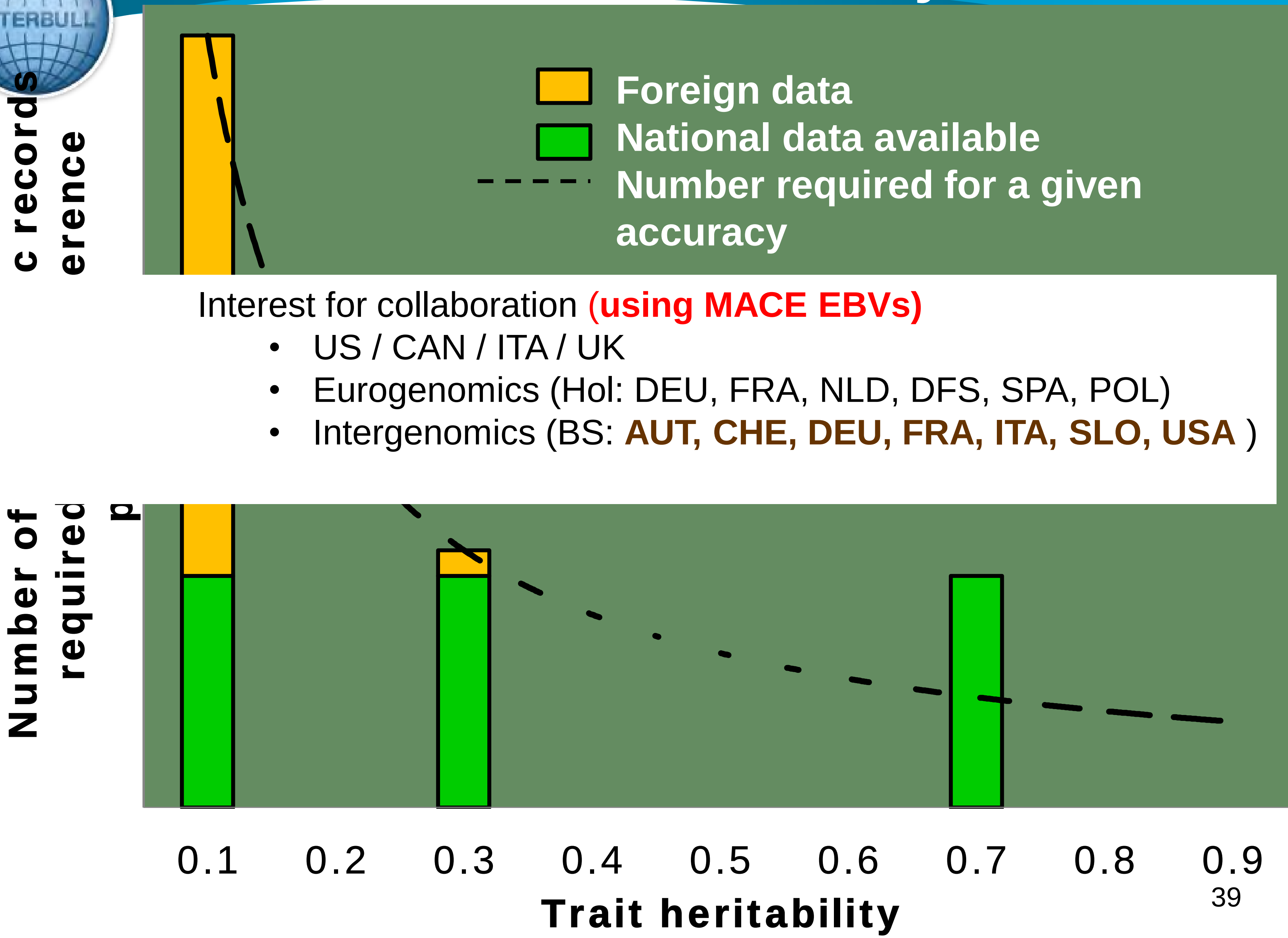
- Interbull Centre Director (ITBCD) → Joao Dürr
  - Decided in Summer 2014 to become 1s director of CDCB in the US
    - Congratulation to CDCB
    - But also big loss for Interbull

Strategic issues

- Change between Interbull customers in the age of genomics

- Interaction between

Reference pop size required for a given accuracy



Interest for collaboration **(using MACE EBVs)**

- US / CAN / ITA / UK
- Eurogenomics (Hol: DEU, FRA, NLD, DFS, SPA, POL)
- Intergenomics (BS: **AUT, CHE, DEU, FRA, ITA, SLO, USA**)

Globalisation in the era of genomics

- Phenotypic information more important than ever
  - Interbull MACE EBVs allow for precise prediction formulas
    - Eg EuroGenomics reference population of 30.000 progeny tested bulls summarises phenotypes of 30 mio cows
- Large consortia for genotype sharing
  - Participation only if certain threshold of phenotypic data is exceeded
- Globally used breeds are able to make use of large amount of phenotypic data
- Commercial bulls now without progeny test
  - New actors might enter dairy cattle breeding

Role of Interbull in the future

- Networking more needed than ever
  - Interbull is the perfect place where science and application meet
- More phenotypic data is needed to utilise more genomic data
  - Long tradition of Interbull
  - Good access to 'data owners'
- New traits need harmonisation for shared use
- Services that allow joint use of genomic data
  - Parentage verification, parentage discovery
- Monitoring of genetic diversity

Interbull - looking ahead

The vision of Interbull as expressed
in the strategic plan decided in 2010:

"The worldwide network providing genetic information services for improvement of livestock"

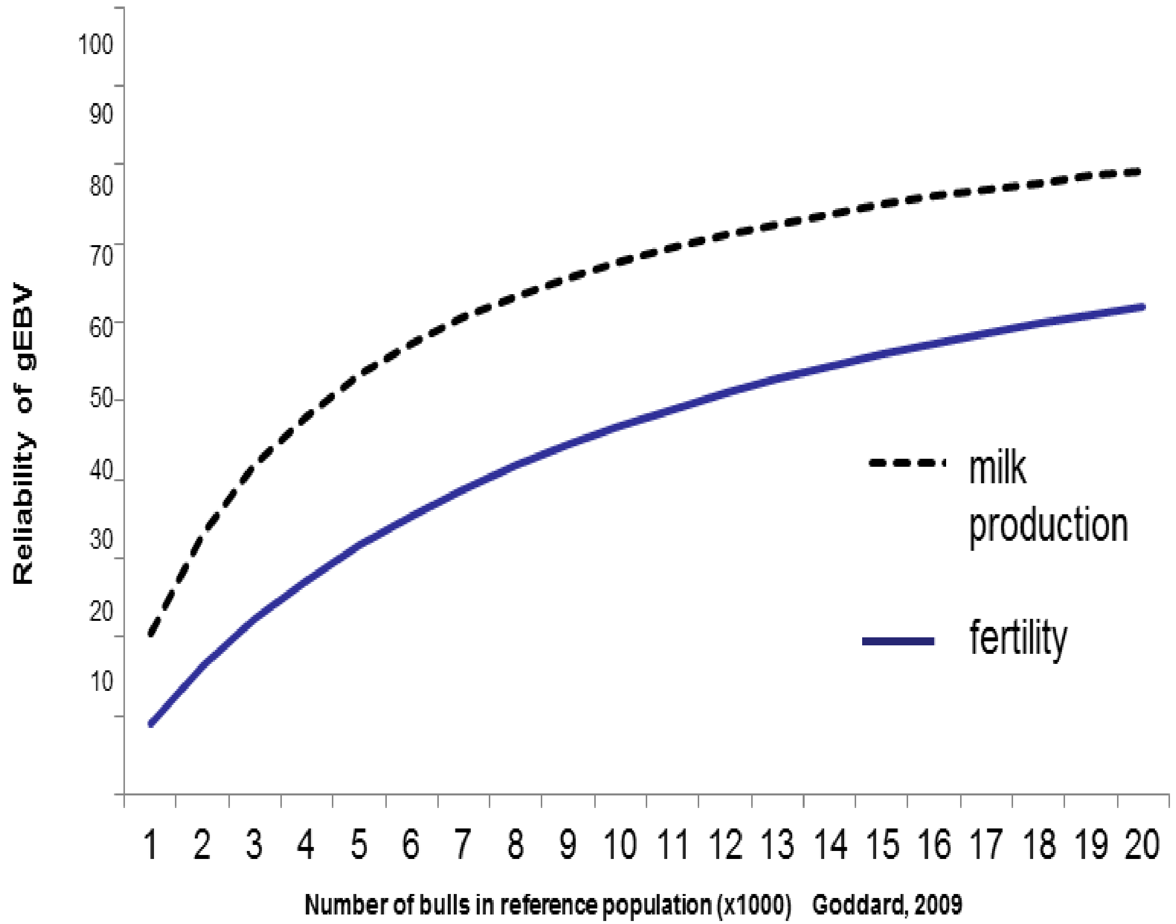
Interbull is a vehicle for the breeding industry that provides a lot of opportunities for demand driven R&D and services in partnerships with its customers!

Jan Philipsson as integral part of this development

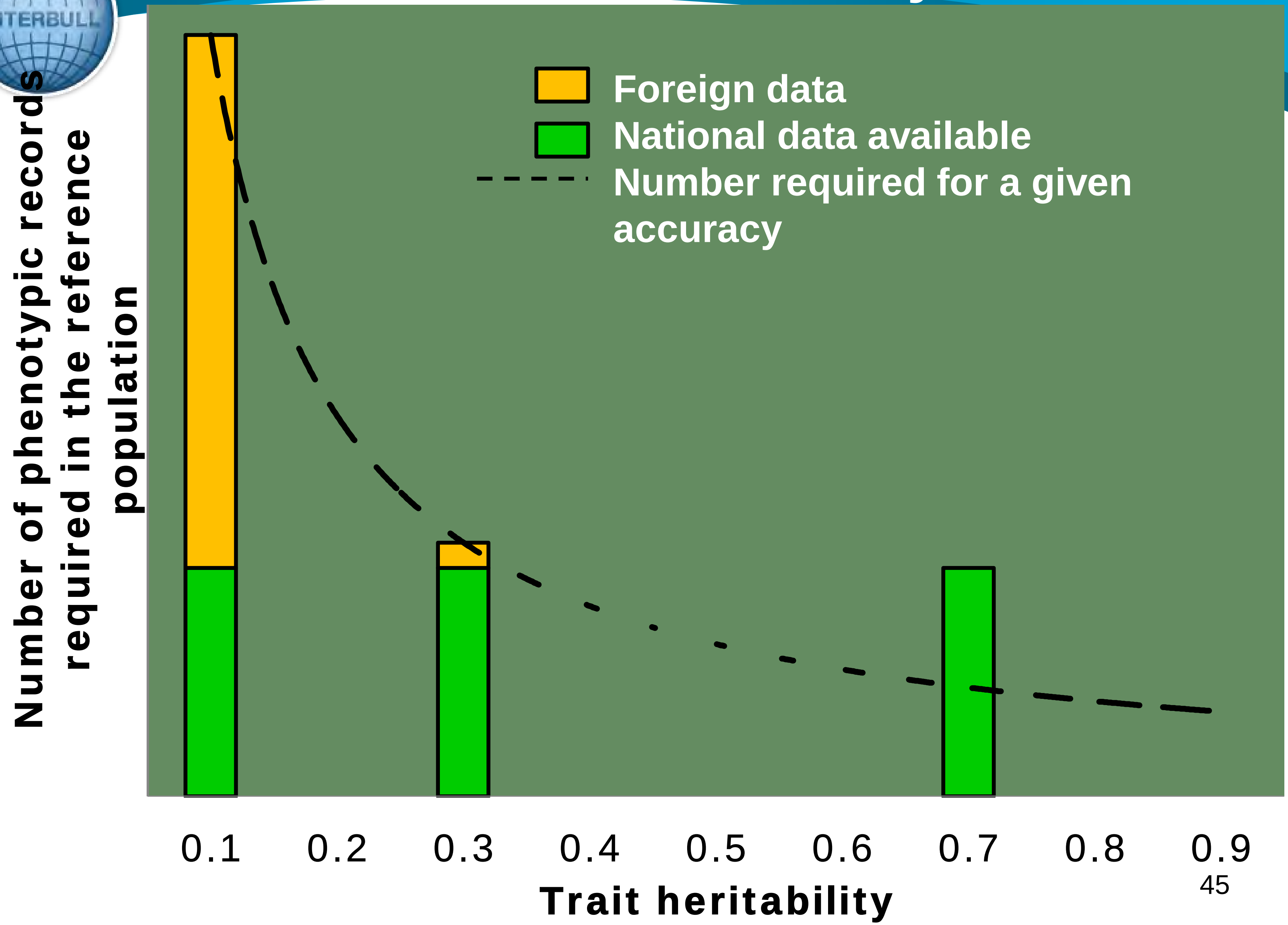
- Networking via

- Annual meetings, joint meetings with
  - EAAP

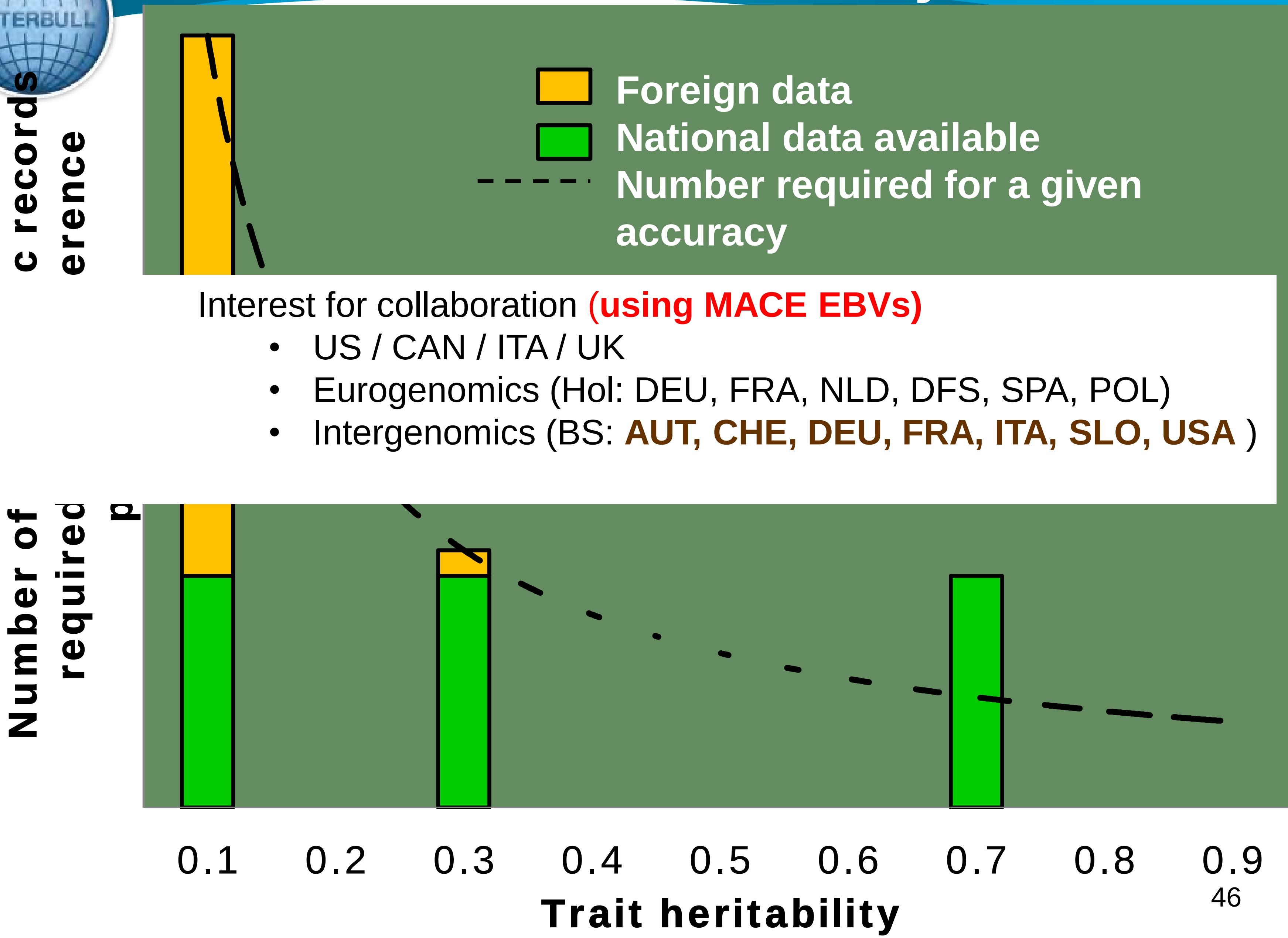
Key factor in application: Size of reference population



Reference pop size required for a given accuracy



Reference pop size required for a given accuracy



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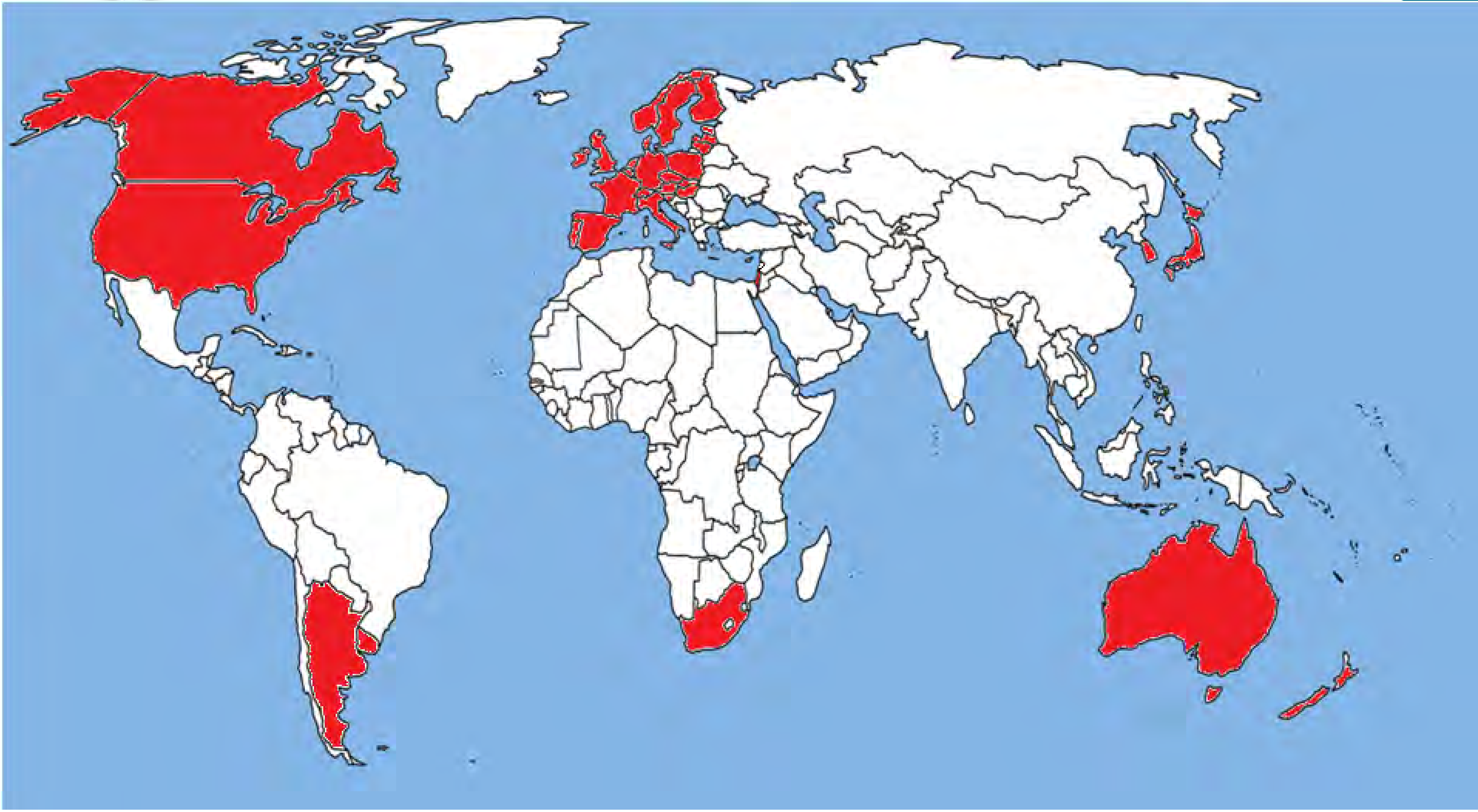
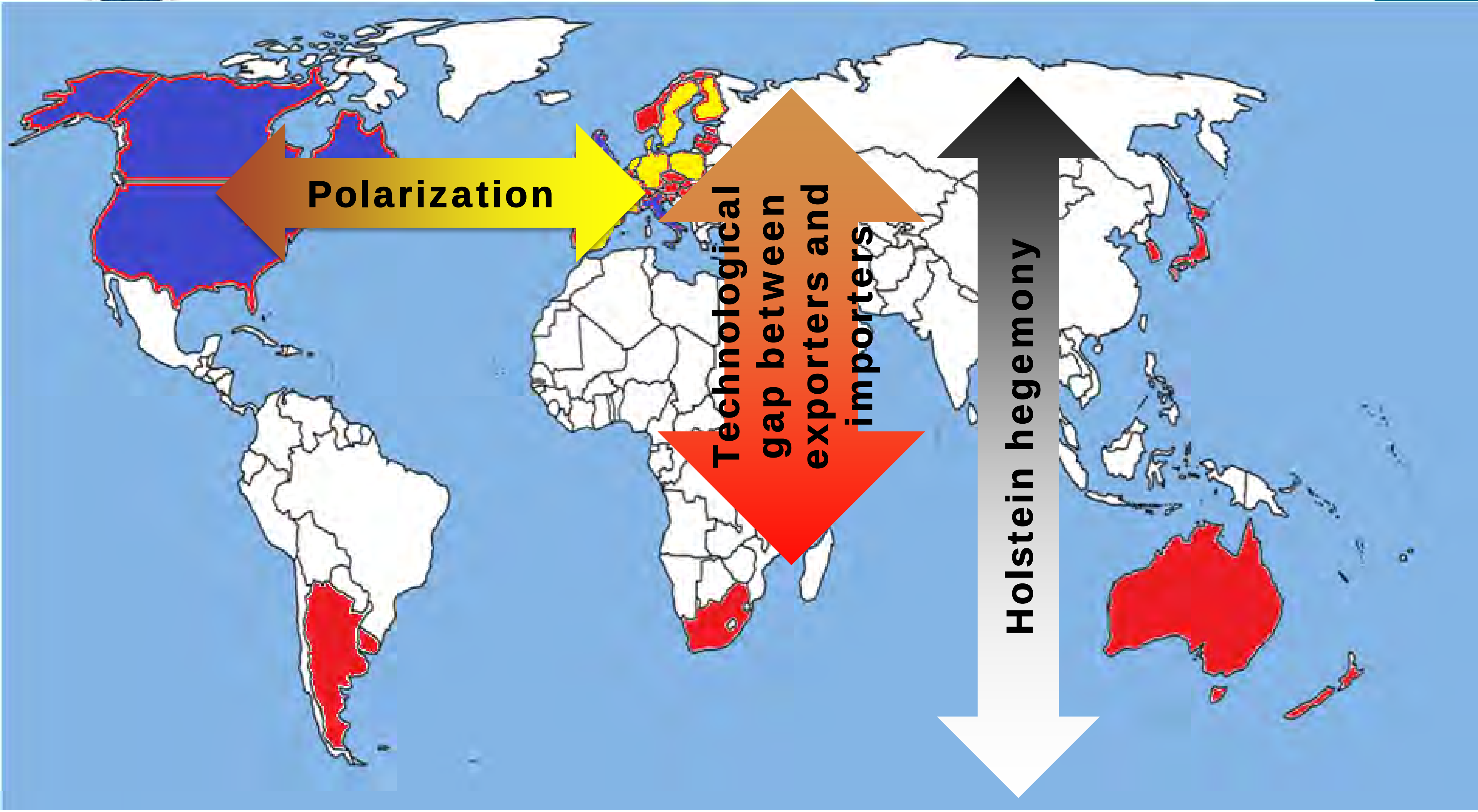
Interbull Map before genomics



Interbull map after genomics



Intercontinental consortium (Holstein)

Eurogenomics consortium (Holstein)

Role of Interbull in the future

- Networking more needed than ever
  - Interbull is the perfect place where science and application meet
- More phenotypic data is needed to utilise more genomic data
  - Long tradition of Interbull
  - Good access to ‘data owners’ via ICAR network
- New traits need harmonisation for shared use
- Services that allow joint use of genomic data
  - Parentage verification, parentage discovery
- Monitoring of genetic diversity
- **GMACE <-> exchange of SNP data**

Relationsship ICAR <-> Interbull II

Operations of Interbull

- Done mainly by staff of the IB centre
  - ITBC staff have a contract with SLU
    - Protection shield of Interbull / ICAR via the Swedish state
    - So far good way to operate with high quality staff

- Budget
  - Service fees under the responsibilty of the IB SC
  - Grants from Sweden
  - EU contribution for role of ITBC as reference lab for EU bovine genetics
- All service money collected by ITBC

Relationsship ICAR <-> Interbull III

- Genomics and new phenotypes lead to opportunities but also threats
- Strong link with ICAR is extremely valuable
  - New customers from breeding and herd management side
  - Use of genomics rely on large amount of harmonised phenotypic data from precisely identified animals → core business of ICAR

Relationsship ICAR <-> Interbull IV

- ICAR board and IB SC have agreed to create a task force that reviews the links between ICAR and Interbull so that the new opportunities are incoporated into the overall strategie of ICAR and Interbull
- The ToR of this TF are ready, we wait until our new ITBCD Toine Roozen is in place

Thank You !

Your Interbull Team

GMACE

- GMACE
  - 2014 (1st half)
    - Fine tuning of methodology
      - Implementation runs
  - 2014 starting in August
    - 1st routine run
    - Traits: same portfolio as MACE
    - Receipients of MACE results are required to make publicly available all results (traits) that they receive from Interbull
      - No requirement to calculate Total Merit Index

GMACE Rules

- Prerequisits for participation
  a. National genomic system Interbull validated
  b. National genomic evaluations approved in a test run
- In early 2014 rules for GMACE participation (re)defined
- Note: with SNP data multiple entries of gEBVs for the same bull possible
- Introduction of BCC information (= Bull controling country)
  - BCC determines if a bull can be incorporated and disseminated via GMACE
  - Intention: Tool to decide from when on a (very young) bull gets GMACE EBVs on international scales

GMACE Rules II

- BCC also used to exclude bulls completely from dissemination though GMACE → used by US and Canada for the implementation runs and routine runs until December 2014
- In early runs a lot of conflicts → multiple countries claimed BCC for an individual bull
  - IB SC decided in May 2014 in Berlin, that in case of conflicts one country with a BCC = publishable overrules the BCC = non publishable

GMACE Participation

- Until december 2014 → DFS, DEU, NLD, FRA (multiple entries), POL, ITA, UK (also with some US bulls), AUS, BEL
- From April 2015 onwards:
  - + Spain, + Canada
- Specific case US
- Unlike CDN CDCB did not participate in test runs any more → no gEBVs from CDCB included
  BUT
  US AI bulls have gEBVs from CAN, ITA and UK
- CDN was assigned for some US bulls with a publishable = yes
- BUT only few US bulls
  - Concern is that they could have been selectively chosen
    - Good in GMACE, poor with use of SNP data in foreign evaluation systems

Interbull - looking ahead

The vision of Interbull as expressed
in the strategic plan decided in 2010:

"The worldwide network providing genetic information services for improvement of livestock"

Interbull is a vehicle for the breeding industry that provides a lot of opportunities for demand driven R&D and services in partnerships with its customers!

Genoex – budget - parentage

Initial investment (€)	Year 1	Year 2
Software (initial licensing)	30,000	0
Data collection functionality (BC Platforms)	5,000	0
DB server	5,000	0
Operational costs (€)		
Software (maintenance fee)		
Internet bandwidth and traffic	0	
Programmer/DB Admin (50%)	15,000	15,000
Scientist (20%)		0
Overheads (33% of salaries)	4,950	4,950
Income source (€)		
Infrastructure grants	40,000	0
Service fees	19,950	19,950
Total income:	59,950	19,950

Service & Daten
aus einer Quelle

vit informiert

IT-Solutions for Animal Production

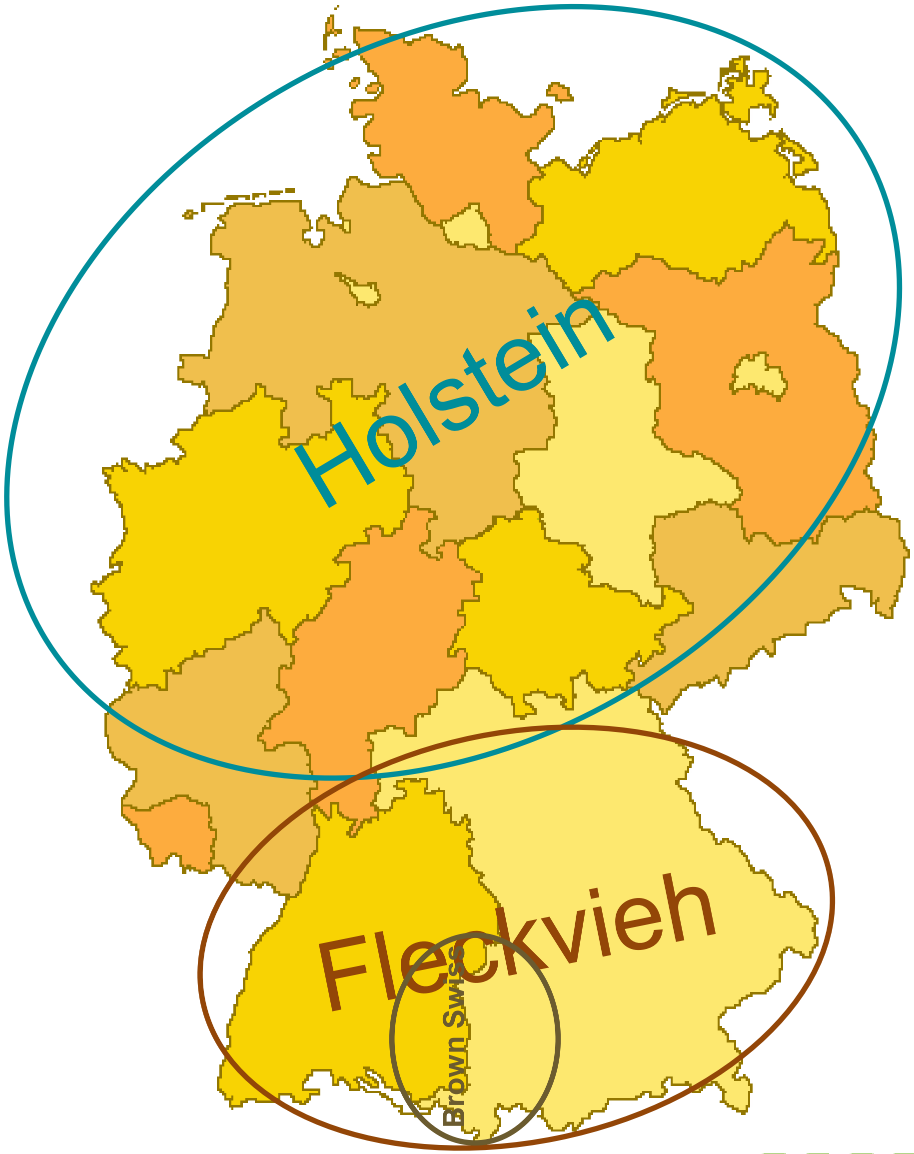
Dr. Reinhard Reents

N:ZWS/Folien/Rreents/VIT_ALLG_2016_eng

Dairy cattle breeding in Germany

- ***12.7 Mio. cattle***

- **4.300.000 dairy cows**
  - ~ 90 % in DHI
  - 2/3 in herdbook
  - 90% A.I.
  - breeds:
    - 2/3 Holstein
    - ¼ Fleckvieh
    - rest Brown Swiss and others (incl. 1,5% crossbreds)



vit: the organisation

vit = Vereinigte Informationssysteme Tierhaltung w.V.

(IT solution for Animal Production)

- **Organized as association (non-profit)**
  - **Founded 1965 in Western Germany (Verden) immediatedly as a private organisation**
  - **Founded 1965 in Eastern Germany (Paretz near Berlin) as state organisation → 1990 privatisation, 1994 merger to vit with Western Germany**
  - **Members are agricultural organizations from Germany and Luxembourgh**

- **Ca. 127 employees and ~14 Mio € turnover**
  - **Most important sector is dairy breeds (ca. 60 % of turnover) including:**
    - **Data processing for milk recording → 1.800.000 cows**
    - **Data processing for herdbook keeping → 2.000.000 cows**
    - **Data processing for artificial insemination → 2.650.000 inseminations**
    - **Genetic and genomic evaluation**
- **Financing (~10 % of revenues are invested in R&D)**
  - **95% service fees**
  - **3% development grants**
  - **2% member fees**

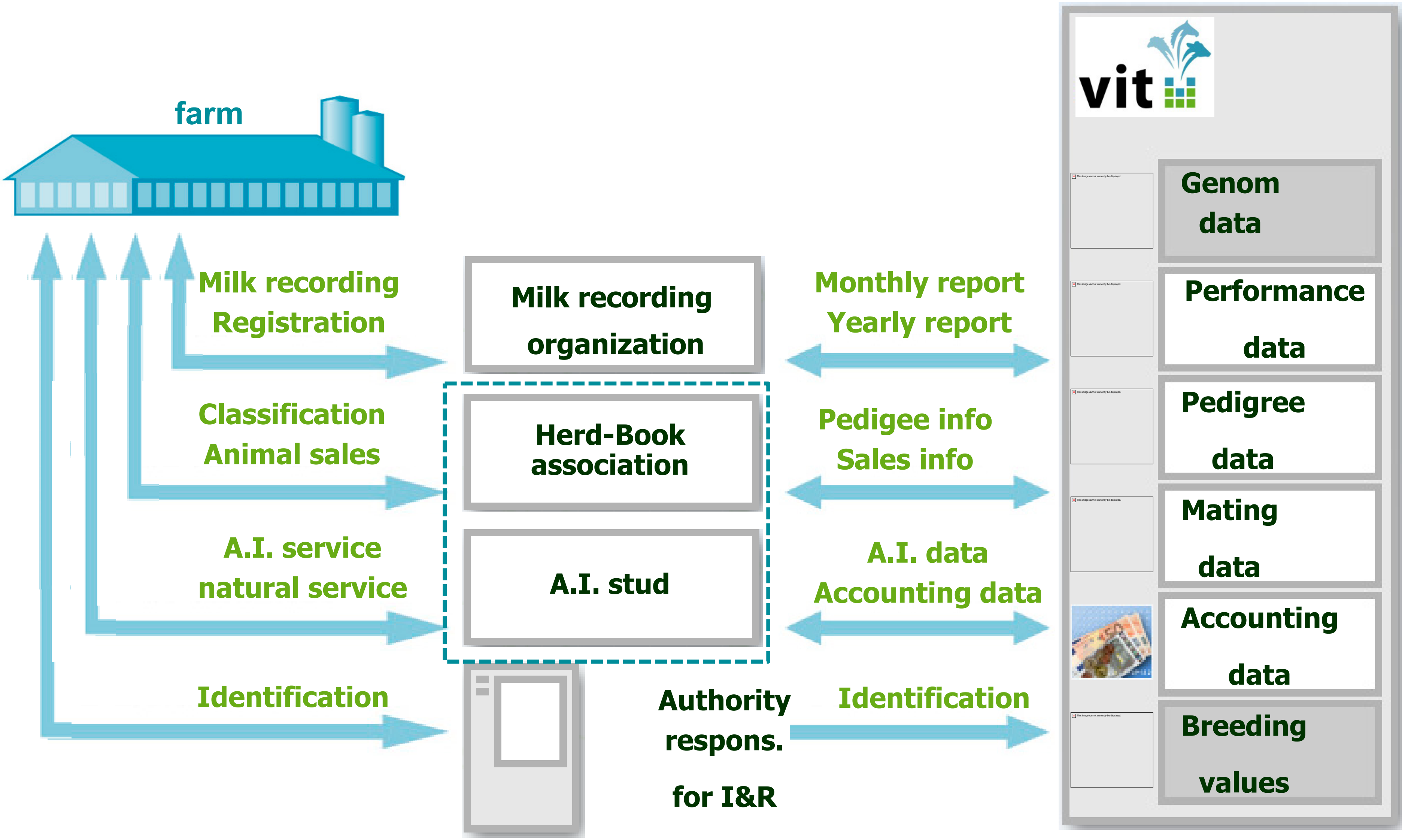
vit – Governance

- board of directors
  - 9 farmers / directors of member organisations
  - appoints a General Manager

- Advisory council (18 members)
  - representatives of member organizations (farmers and full-time staff)
  - representatives of agricultural administration (advisory role)

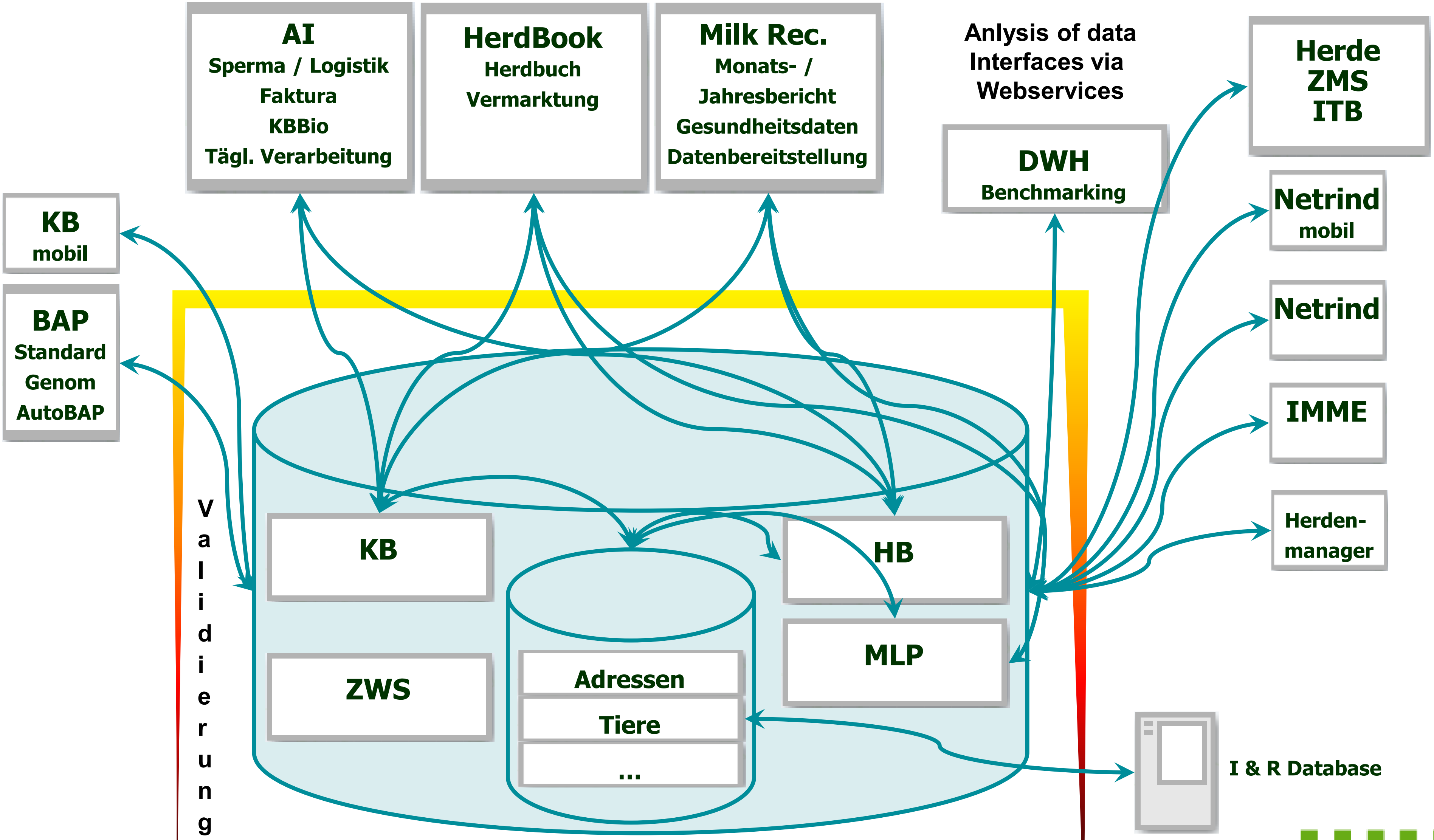
- the council appoints different technical committees (TC)
  - TC milk recording (permanent)
  - TC herdbook system
    - dairy cattle (permanent)
    - beef cattle (permanent)
    - sheep and goats (permanent)
  - TC horse breeding (permanent)
  - …
  - TC dealing with new legal aspects (non-permanent)
  - …

Services for dairy breeding in summary



Integrated Database

On farm



Access to the integrated database ?

- In Germany there is no ownership right to data! Unlike for land, cars, etc.

There are

- Allowance to use data
  - Who is allowed to use the data, store it and change the content?
- Allowance to distribute data
  - Who is allowed to disseminate data to someone that has the right to use the data

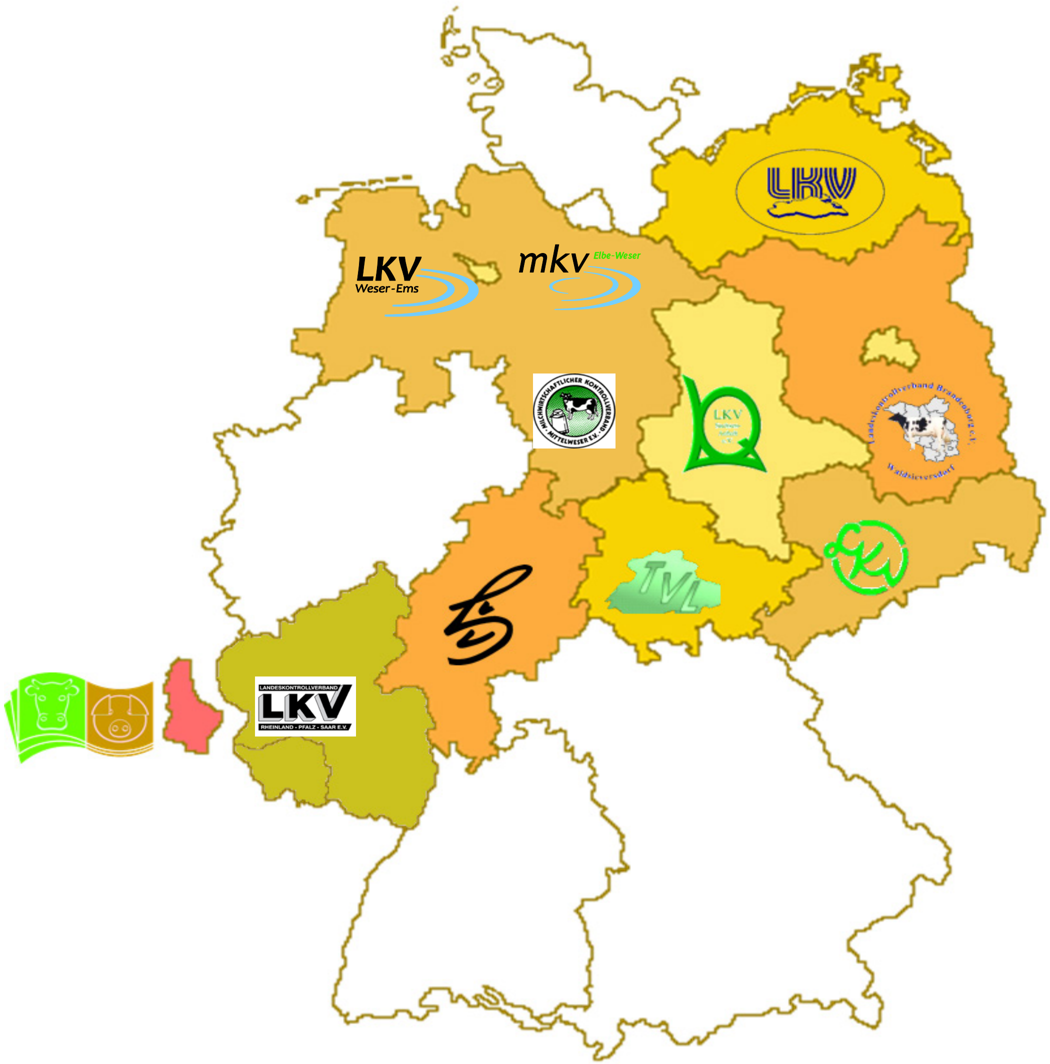
These right are determined by

- Who has generated the data (eg farmer that reports a mating) or paid for it
- Who has been given the duty to generate the data (eg milk recording organisation to analyse the milk samples)
- Through generating information from raw data to complexer information (eg in an algorithm that computes 305 day lactation data)

vit – Data Processing for Milk Recording

- 8 of 12 German
  milk recording organizations
  plus
  CONVIS Luxembourg
- for 1.800.000 cows / month
  = 75% of all officially
  milk recorded
  Holstein cows
- 15.407 dairy farms

- Maintenance of the database
- Monthly reports
- Benchmarking
- Data accumulation on farm, incl health data
- Data exchange (advisors etc.)



vit – Central Herd-Book Data Base for Dairy Cattle

- for all 14 German Holstein herdbook associations plus CONVIS Luxembourg

- 82.852.032 animals in online access
- 2.049.062 active cows on 18.450 farms

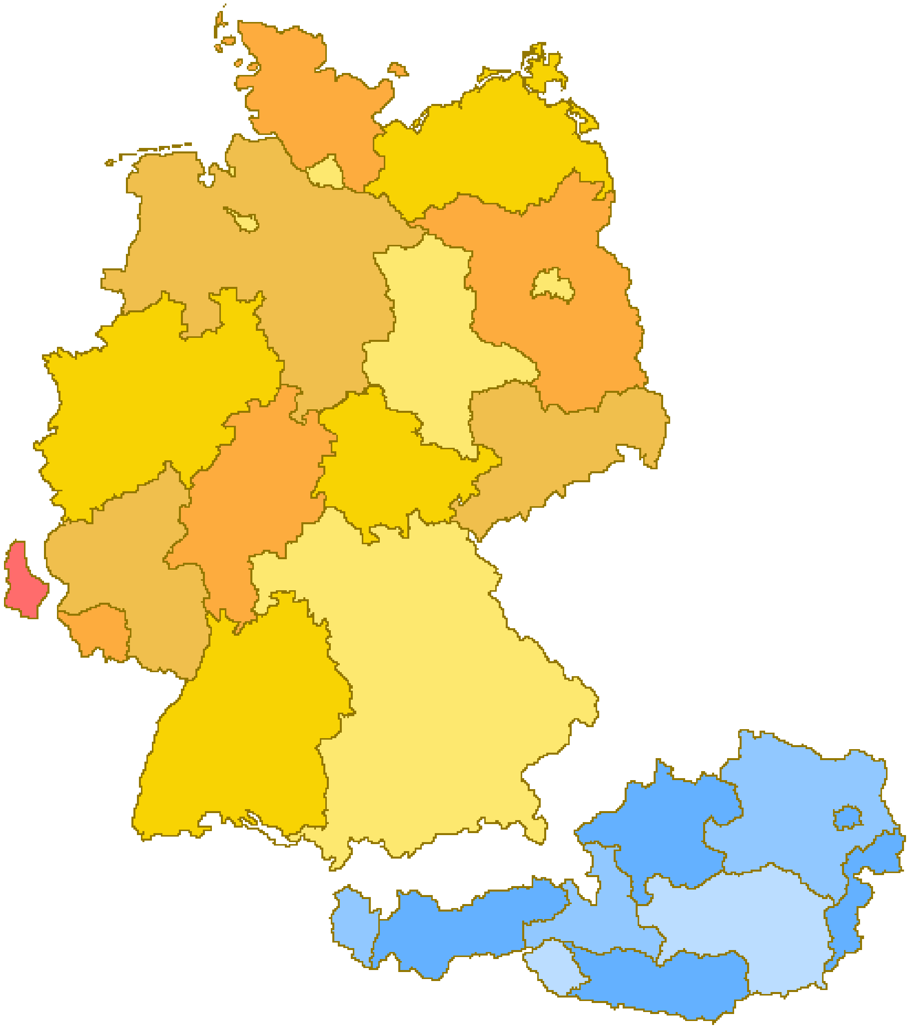
- Main activities of Breeding organisations
  - AI services
  - trading of animals
    - Auctions,
    - Export,
    - farm to farm
  - (pedigree, parentage)

vit – Estimating Breeding Values for Dairy Cattle

- Black Holsteins
- Red Holsteins
- Red Cattles
- Jerseys

- Germany
- Luxembourg
- Austria

- until 2013 state control:
  from 2014 Breeding organisations in charge
- Genomic evaluation with large reference population currently > 33.000 bulls



Sharing of data between different parties

- In Regions with ALL data processing within vit (75% of DHI data)
  - No payment to DHI from Breeding organisations (win to win for both)
    - DHI gets 1st class data on pedigree, inseminations, genetic and genomic evaluations from BO → high standard of the monthly reports
    - In return BO access to 1st class data from DHI
      - Herdbook work
      - Sales of animals
        - For export data about quality of the animal
        - Farm to farm → even across regions full data content with the animal
      - Mating programs
      - Genetic and genomic evaluation

- In regions with separate DHI processing → BO has to subside (or buy data) from the DHI organisation to get data (ie send the data to vit) for herdbook purposes and genetic evaluation

On farm data

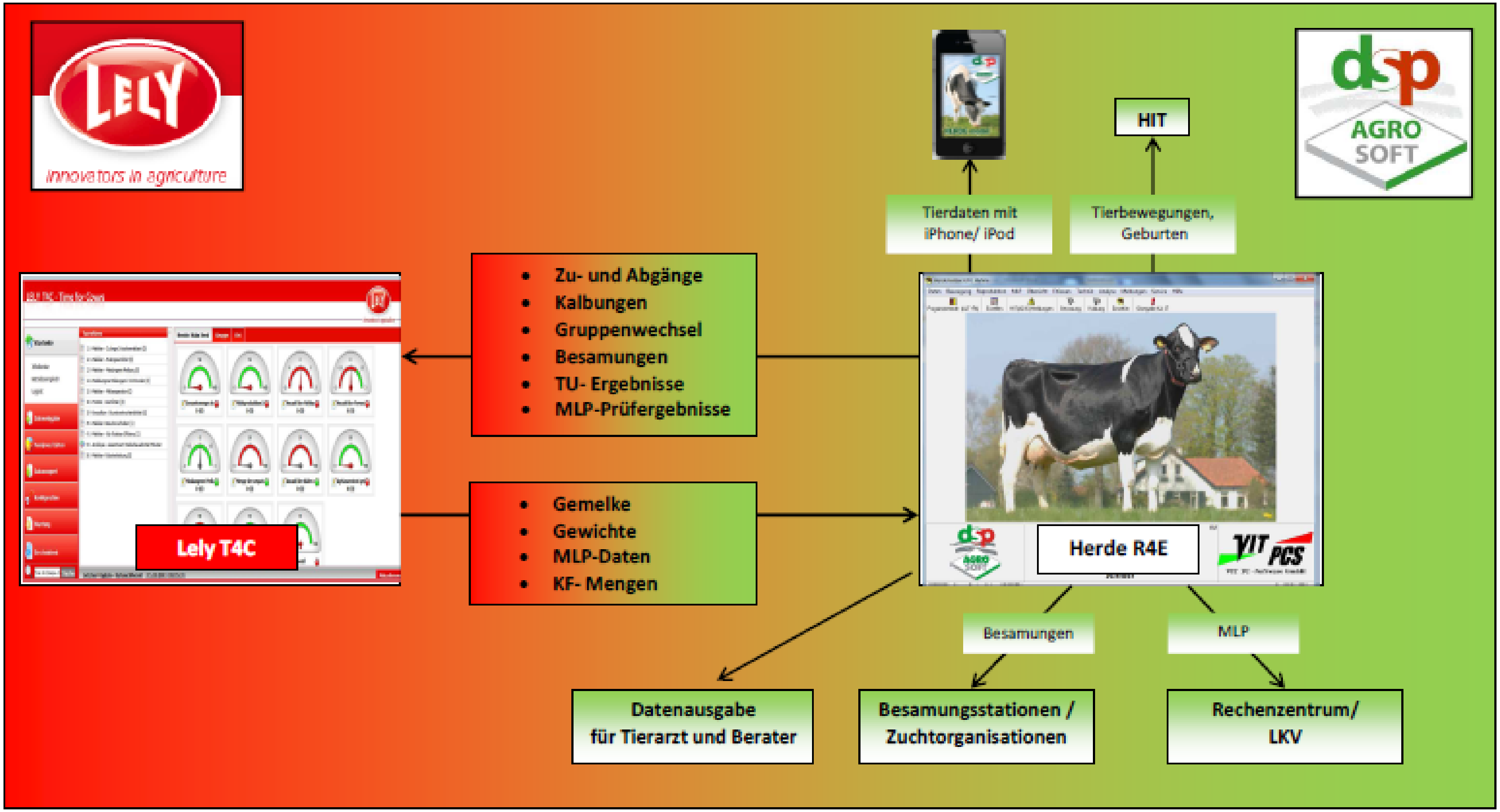
- In eastern Germany always big farms (on average > 250 cows)
  - Specialised PC software company (spin off from former GDR computing centre) had big market share after the unification of Germany
  - Mid 90ties tendency to keep data only on farm (or sell it)

- vit board decided 1997 to buy 50 % of the company
  - Joint product development and streamlinee interfaces between central and on farm data processing
    - Main product is herd management software (*'Herde'*) → 70% market share

Herde

- About 3500 farms in Germany -> **1 Mio. cows**
- Medium and larger herds
- Stand alone PC-Programe
- Large number of interfaces to milk parlours, Lely-Robots, Heattime, feeders … -> **new phenotypes**
- Capturing of claw data, direct interfaces to PC / mobile software of hoof trimmers and vets
- Collection of health data, inseminations, I&R data
- Mobile version for IOS
- Special Module (ZMS) for field advisors
- Mating advice from BAP available
- The coding of health data in Herde became standard in Germany and later international as ICAR standard

Example: Interface with Lely robots



Internet application Netrind

- For smaller herds (50-200 cows)
- About 1300 farms use Netrind DHI, 3150 farms Netrind AI
- In the Browser
- Cheap (50-100 EUR per year)
- Main reports of the milk recoding processing plus action lists
- Capturing of health data, hood trimming data, inseminations, I&R data
- Tool for field advisors to get access to farmers data
- Mobile device for Android
- Mating advice from BAP available

Use of this huge, komplex data pool with 30 client organisations (more than staff 800 users)

- Joint data pool (~80 mio animals) enables all clients to have optimal data quality
  - Cross checks even with movements across regions possible
  - Corrections of data content immediatedly available to all users

But

1. How to share sensitive data → solved by access rights to the database

2. How to integrate further data (eg ERP) with the data that belongs to animals / farms

3. Individual queries / requests / reports on the ‚own' data set, for
   - R&D work
   - Few herds

   - Solutions until 2013
     a. Individual software tools developed by vit
     b. extract of data and analysis with tools within the organisation

Migration process

- Analysis showed that future needs require IT architecture which is close to Internet application (migration from mainframe to new plattform)

  Other main aspect → availability of programmers (no PL1, Natural, etc.)

  Solution

  - Linux operating system
  - Oracle database
  - Java software development

- Experience showed that software development with Java is only slightly ‚cheaper‘ than with previous languages

- Problem remains that for ad hoc questions of individual customers the complex database and complex data structures is a challenge

  Solution

  - **Integration of a Data Warehouse**

Data Warehouse (DWH)

- Is an IT system that
  - **E**xtracts, **T**ransform, **L**oads complex source data into a

    dimensional data store

  - And then supports and implements

    querying and analysis

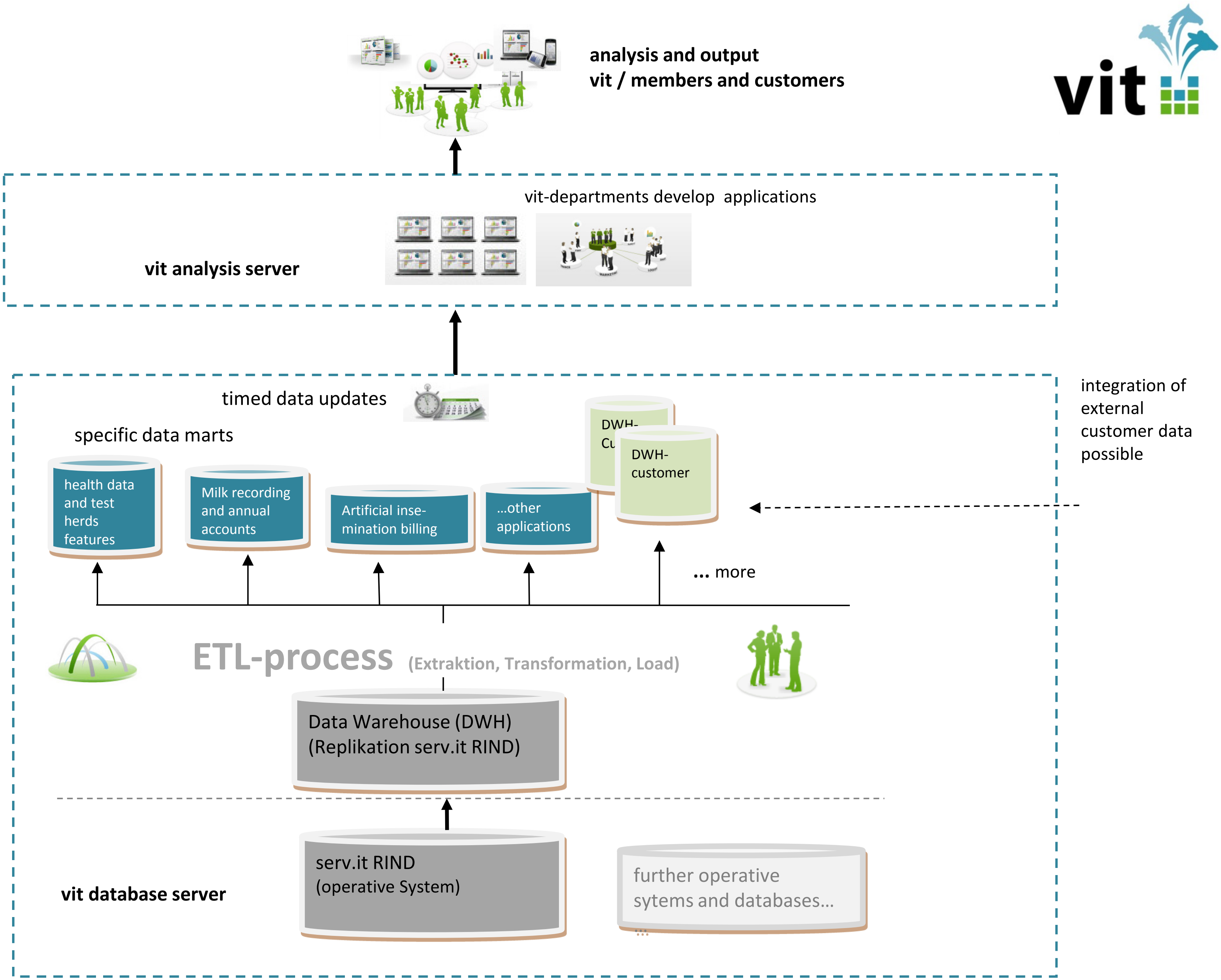
    for the purpose of decision making

- Compared to other means (HQL, SQL) to extract information from complex data structures the use of a DWH does **not require this expert know how**

  → moves decision support systems from the IT department to the users / responsible staff

- The in memory technology guarantees high performance

→ vit has chosen QlikView as the reporting and analysing tool


analysis and output
vit / members and customers
vit-departments develop applications
vit analysis server
timed data updates
specific data marts
health data and test herds features
Milk recording and annual accounts
Artificial inse-mination billing
...other applications
DWH-customer
integration of external customer data possible
... more
ETL-process (Extraktion, Transformation, Load)
Data Warehouse (DWH) (Replikation serv.it RIND)
serv.it RIND (operative System)
further operative sytems and databases...
vit database server

Case study 1

- Contract herds for use as cow reference population

  - Two regions in Eastern Germany record additional health and performance data
    - 87 herds (av. herdsize 700 cows) → ~ 60.000 cows
    - Disease diagnoses
    - Weight at calving
    - Hoof trimming
    - Conformation on all heifers
    - ...

aims:

a. Have an optimal infrastructure for R&D questions to use data in genomic evaluation
b. Quarterly reports to farms (for management decisions → motivation to collect data for a continuous period)

→ front end to the farmer

Case study 2 → report to farms (health data)

Quartalsbericht: Calving Trails

Verband: RMV	Betrieb:	Zeitraum: Okt-Dez 2013

Kalbungen gesamt

Merkmal	Quartal	Vorquartal	RBB Quartal	RMV Quartal	Rangierung RMV
Anzahl (n)	792	826	9.926	7.186	
Totgeburten (%)	6,4	8,8	6,1	6,5	
KV schwer (%)	6,2	5,4	3,6	7,0	
Geburtsgewicht (kg)	44,3	43,3	41,7	42,3	

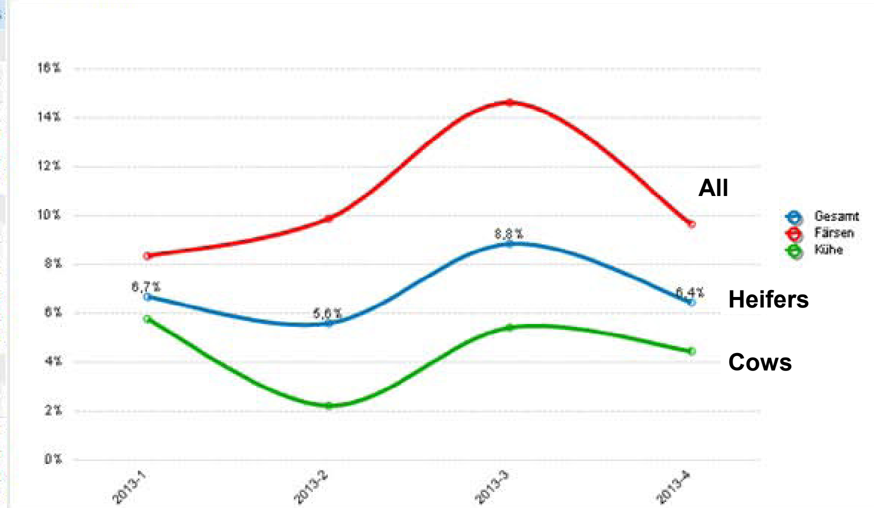
Färsenkalbungen

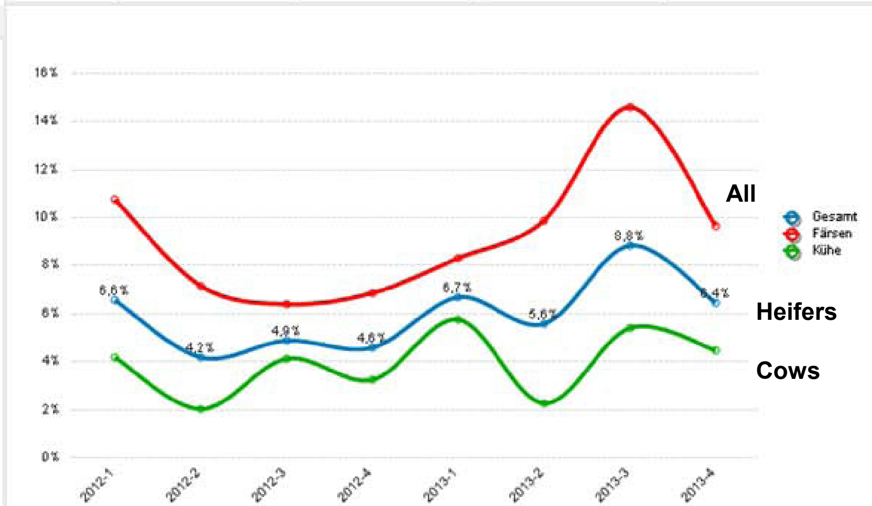
Merkmal	Quartal	Vorquartal	RBB Quartal	RMV Quartal	Rangierung RMV
Anzahl (n)	301	308	3.193	2.419	
Totgeburten (%)	9,6	14,6	9,4	10,5	
KV schwer (%)	12,0	9,1	4,7	10,4	
Geburtsgewicht (kg)	42,4	41,1	39,6	40,2	

Kuhkalbungen

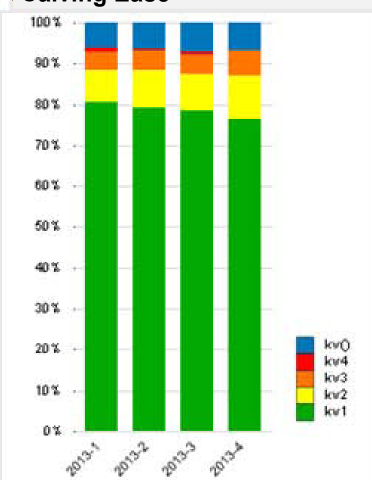
Merkmal	Quartal	Vorquartal	RBB Quartal	RMV Quartal	Rangierung RMV
Anzahl (n)	491	518	6.733	4.767	
Totgeburten (%)	4,5	5,4	4,5	4,4	
KV schwer (%)	2,6	3,3	3,1	5,2	
Geburtsgewicht (kg)	45,3	44,5	42,7	43,3	

% Stillbirth

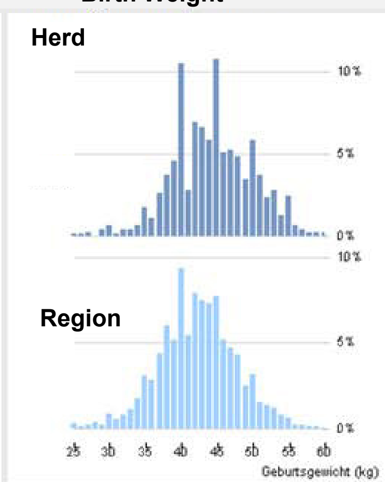




Calving Ease



Birth Weight



DWH summary

- Introduction of a Data Warehouse System is a complex project

- Requires large initial investment
  - Technical infrastructure
    - ETL process
    - Server → In Memory Technique
    - Developer licences
    - User licences

  - Training of experts for implementation of projects
    - Analysis of the business rules
    - ETL
    - Development of reports

- Very positive Feedback from those customers that take the time to learn about new features and apply it

Whats next in Genomics: changes structure

- AI organisations
  - New opportunities (genomic evaluation)
  - New challenges
    - New players with access to genomic evaluation have cheap way of using historic investments of cooperative AI organisations
  - New mergers in Germany Masterrind (+ WEU), RA (from RSA RMV), others?

- Farmers have to invest more if they want to be in the elite breeding business

- International cooperation more important than in the past

- Bull reference populations have to be replaced by cow reference pop.
  - Also important for new traits

Health data available at vit (phenotypes, few genotypes)

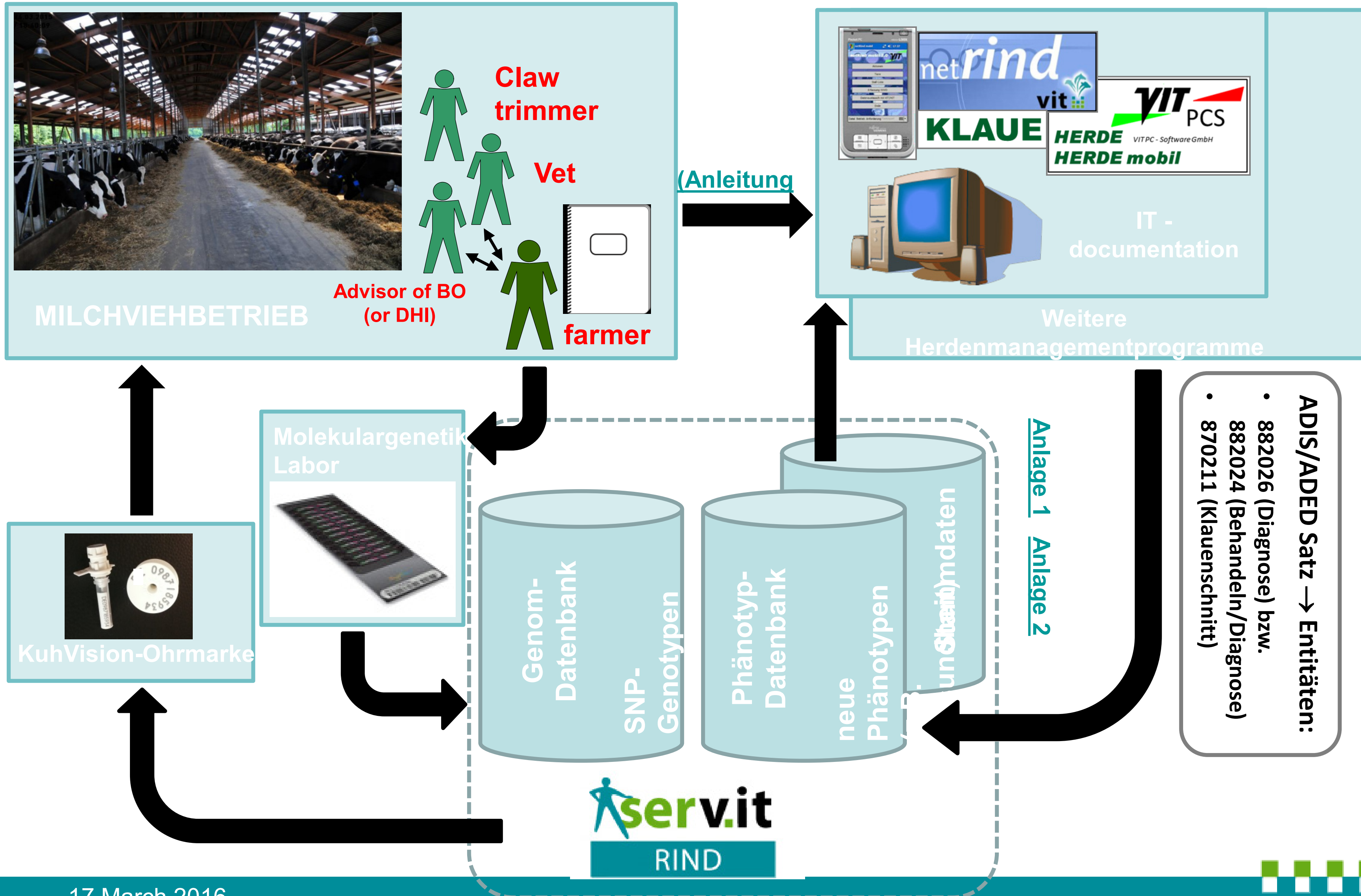
Pilot studies / Research, 3-5 years

Routine since 8-9 years

Kenngröße	***NDS***	***RPF***	***HES***	***THU***	***SAA***	***SAC***	***BRB*** (*RBB/RA Contract herd system*)	***SAA*** (*RBB/RA Contract herd system*)	***MVP*** (*RBB/RA Contract herd system*)
Datenerfassung (Herdenmanagement-Programm)	NETRIND u.a.			HERDE u.a.			HERDE u.a.		
Gesamtzahl Betriebe	**131**	**59**	**75**	**49**	**13**	**5**	**50+5**	**4**	**26**
Zeithorizont (Gesundheitsdaten ab ...)	01/2010	09/2013	12/2013	01/2009	01/2010	01/2011	06/2008	10/2009	01/2007
Herdengröße (mittlere Anzahl Kühe pro aktivem Betrieb 2015) *	N_{Betr}=53: 121 (Max.593)	N_{Betr}=40: 96 (Max.297)	N_{Betr}=46: 106 (Max.313)	N_{Betr}=33: 671 (Max.1.647)	N_{Betr}=5: 632 (Max.750)	N_{Betr}=3: 462 (Max.555)	N_{Betr}=50: 703 (Max.2.656)	N_{Betr}=3: 1.154 (Max.2.431)	N_{Betr}=23: 731 (Max.2.274)
Ausgangsdaten insgesamt	Gesundheitsdaten aus 333 Milchviehbetrieben in 3 West / 3 East						Gesundheitsdaten aus 80 Milchvieh-betrieben in 3 East		
Diagnose-meldungen	**rund 1,79 Mio. (682.156 Erkrankungsgeschehen)**						**rund 4,06 Mio. (1,47 Mio. Erkrankungsgeschehen)**		
Tiere mit Diagnosen	**174.821**						**393.798**		
Umfang des Gesund-heitsmonitorings	**rund 295.000 Tiere,** davon 196.000 weibliche Tiere (110.000 cows)						**rund 554.000 Tiere,** davon 342.000 weibliche Tiere (193.000 cows)		

Stand: 02.11.2015 (Gesundheitsdaten 01/2007 - 09/2015); *mind. 3 Monate registriert und mit Diagnosemeldungen

Roll out of KuhVision in all Germany



Key factors for vit (and the German dairy industry)

- The base of our success:
  - neutrality
  - member/client oriented
  - skilled and specialized employees for all fields of data processing around breeding and management of farm animals
- What makes us unique:
  - One of the biggest INTEGRATED data base for cattle worldwide
  - we work for many different clients/competitors
    - but all clients have full control on their data
    - maximum synergy effects by joint use of data/software/skills
    - Manage IP in closed groups of investors (e.g. genomic selection) → difficult for free riders
- Our vision:
  - Expand the services to more areas (biosensors on farm, infrared spectrum data from milk labs, etc.) → more connection to technics on the farm
  - (Expand the services to more countries, internationalisation)


The only
reason
I'm big
is because
a tiny body
couldn't store
all this
personality

vit

IT-Solutions for Animal Production

2016 AGIL Report

John B. Cole

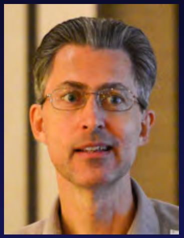
Animal Genomics and Improvement Laboratory
Agricultural Research Service, USDA
Beltsville, MD

john.cole@ars.usda.gov

AIP objectives

- Expand national and international collection of phenotypic and genotypic data
- Develop a more accurate genomic evaluation system with advanced, efficient methods to combine pedigrees, genotypes, and phenotypes
- Use economic analysis to maximize genetic progress and financial benefits from collected data

AIP scientists



- Paul VanRaden (project leader)
  - Genomic evaluation methods, haplotypes

- George Wiggans (CDCB liaison)
  - SNP selection, genotype exchange, goats

- John Cole (acting research leader)
  - Fertility, health, heat stress resistance, indices

- Derek Bickhart
  - Sequence data analysis, genome assembly correction and gene annotation

- Kristen Parker Gaddis (UFL postdoctoral associate)
  - Fertility, health, use of sequence data

Recent research and changes

- Genomic evaluations for Guernseys
- Breed composition and GPTAs for crossbreds
- Increase to 77,531 SNPs used for evaluations (includes 30 gene tests provided by GeneSeek)
- New GeneSeek 7K chip
- New Affymetrix 44K chip

Recent research and changes cont'd

- Imputed dams now used for parent-progeny checks
- Goats (separate management groups for miniature and standard)
- Developed an efficient procedure for syncing the AIP and CDCB databases
- Additional traits (cow livability, age at first calving, persistency)
- Changes to calving traits models

Cow livability - Background

- Reasons for disposal have been reported and stored in DHI records since 1970
- About 20% of cows die instead of being sold across all lactations
- Death loss per lactation averages 7%, higher in later, lower in earlier lactation

Productive life (PL) vs. Livability (LIV)

- PL measures cow's ability to avoid dying or being culled
- LIV measures cow's ability to stay alive
- LIV is a subset of PL

LIV model

Definition

- Reverse of mortality:
  - 0 = died this lactation
  - 100 = lived this lactation
- Multiply by average lactations/cow (2.8) to put on a lifetime scale

LIV model cont'd

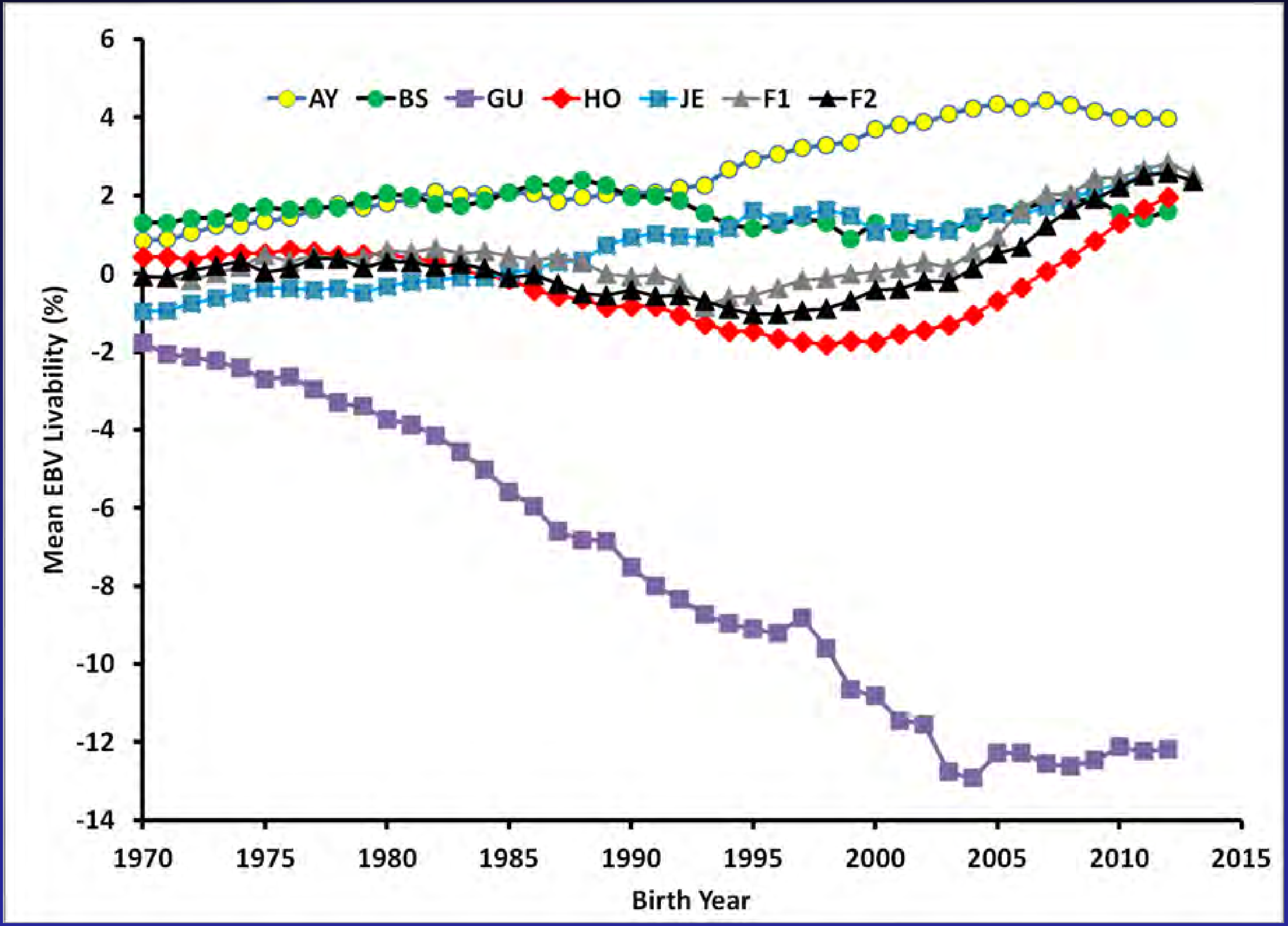
- **Data**
  - **92 million records on 32 million cows**
- **Methodology**
  - **Multi-trait 1-step model with PL (by lactation) using similar edits as other traits**
- **Heritability of 1.3 *(Miller et al., 2008)*, genetic correlation with lactation PL of 0.50**

Correlation of PTA LIV with other trait PTA

Trait	HO	JE
Milk	0.09	-0.08
Fat	0.21	0.01
Protein	0.16	-0.01
Productive Life	0.70	0.54
SCS	-0.28	-0.07
Daughter Pregnancy Rate	0.40	0.54
Cow Conception Rate	0.40	0.33
Heifer Conception Rate	0.28	0.32
Number of bulls	45,840	3,893

Bulls born 1990 or later, minimum 50 daughters, 0.50 rel for PTALIV.

LIV genetic trends 1970-2013



Genetic improvement of cow health

- Compute breeding values for 6 common health events

Trait	Incidence rate (%)	Heritability
Displaced abomasum	2.20 ± 0.42	0.32 ± 0.04
Ketosis	5.15 ± 0.78	0.14 ± 0.03
Mastitis	12.32 ± 1.06	0.10 ± 0.01
Metritis	6.86 ± 0.47	0.07 ± 0.01
Milk fever	2.40 ± 1.06	0.10 ± 0.01
Retained placenta	4.60 ± 0.63	0.36 ± 0.08

Sources: Parker Gaddis et al. 2015. J. Dairy Sci. 97:3190-3199;
Uribet el al. 1995. J. Dairy Sci. 78:421-430.

- Reflects economic importance, heritability, and reporting consistency based on analyses of field data

Health Merit $ and NM$

- HM$ will provide a single value that farmers can use to make selection decisions
  - Change in lifetime income due to reductions in health care costs (e.g., $50)
  - Preferred to selection on individual traits
- Can be added into NM$ similarly to CA$
- Similar concept to Zoetis's new Wellness Trait Index (WT$)

VERY Rough Draft of HM$

- Correlations assembled from several sources – need to re-estimate!
- Economic values from Liang (2013)
- HM$ = (0.35 x DSAB) + (0.17 x KETO) + (0.14 x MAST) + (0.08 x METR) + (0.08 x CALC) + (0.18 x RETP)
  - Rough numbers, more work needed!
  - Does not yet account for any other traits!

Genetic correlations

- **Health traits are correlated with other traits already included in NM$**

Trait	DPR	PL	Milk yield	SCS	NM$
Displaced abomasum	-0.47	-0.47	0.02	0.19	-0.35
Ketosis	-0.48	-0.48	0.02	0.25	-0.40
Mastitis	-0.19	-0.27	0.09	0.56	-0.21
Metritis	-0.35	-0.18	-0.21	0.01	-0.37
Retained placenta	-0.44	-0.34	-0.05	0.24	-0.30

Source: Parker Gaddis et al. 2015. J. Dairy Sci. 97:3190-3199.

- **Easy to over-state gain from new traits if correlations not well-estimated**

Correlations of SCS with mastitis

Correlation	CAN	DFS	FRA
USA SCS, foreign MAST	0.87	0.87	0.86
USA SCS, foreign SCS	0.94	0.88	0.90

Genetic correlations estimated by Interbull, Dec 2015

Genetic correlation estimated by Zoetis = 0.45

Added value from more traits

Year	Traits	Added	Data	Corr	Gain
1977	3	Protein	DHIA		
1994	5	Productive life, SCS	DHIA	0.84	19%
2000	18	Size, udder, feet / legs	Breeds	0.94	6%
2003	21	Pregnancy rate, calving ease (sire, dtr)	DHIA / NAAB	0.98	2%
2006	23	Stillbirth (sire, dtr)	NAAB	0.98	2%
2014	25	Heifer, cow conception	DHIA	0.97	3%
2016		Cow death	DHIA	> 0.99	< 1%
2016	31	6 more health traits	Zoetis	0.92 ??	21% ??

Use in Selection Programs

- Avoid using bulls with undesirable PTA
  - Not all bulls with high rates of daughter illness have low NM$
- Select on an index
  - This ensures that you don't overemphasize one trait or another
  - Results in optimal rates of genetic gain

Acknowledgments

- Council on Dairy Cattle Breeding
- National DHIA
- Binational Agricultural Research and Development (BARD)
- National Institute of Food and Agriculture (NIFA), USDA
- Washington State University & University of Missouri (NIFA grant)
- CNPq “Science Without Borders” Program

Disclaimer

Mention of trade names or commercial products in this presentation is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the US Department of Agriculture.

Questions?

Annual Managers Meeting

1965 - 2015 50 YEARS

NATIONAL DHIA

March 8, 2016 - Orlando, Florida

Improving Our Communications Workshop

NATIONAL DAIRY BOARD

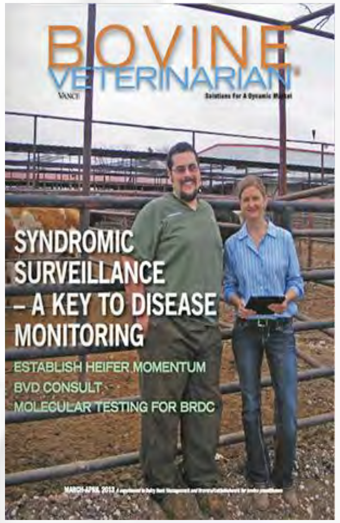
UNITED DAIRY INDUSTRY ASSOCIATION™

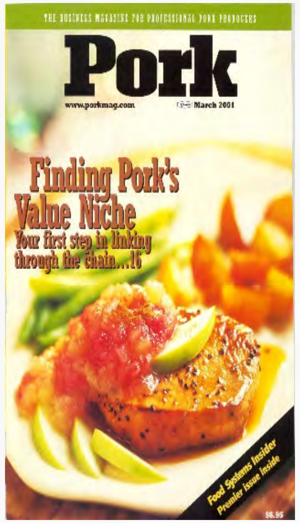
Stan Erwine Vice President of Farmer Relations and Activation

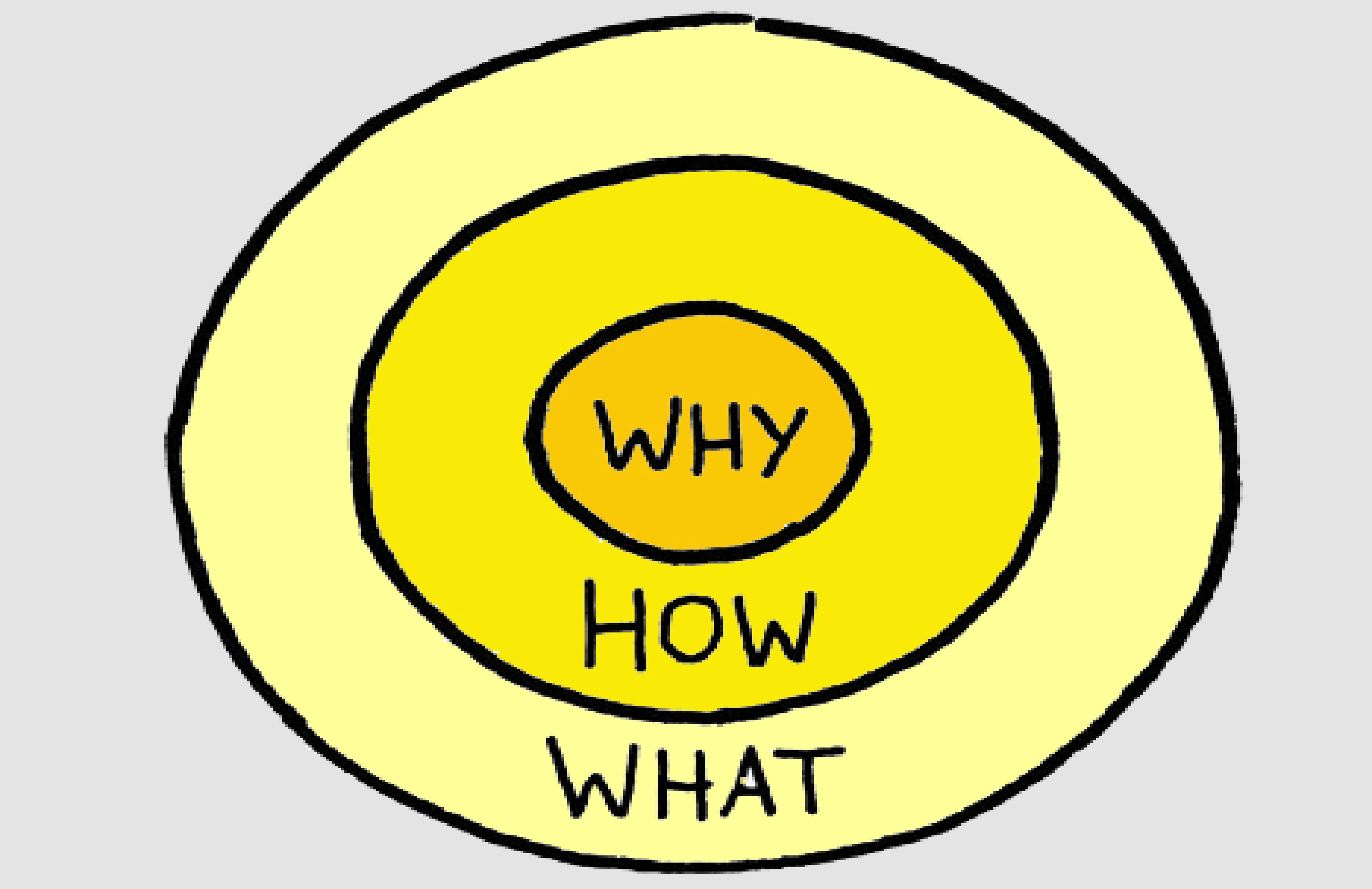
DMI DAIRY MANAGEMENT INC.™

Twitter:@Stan Erwine

Facebook: Stan Erwine





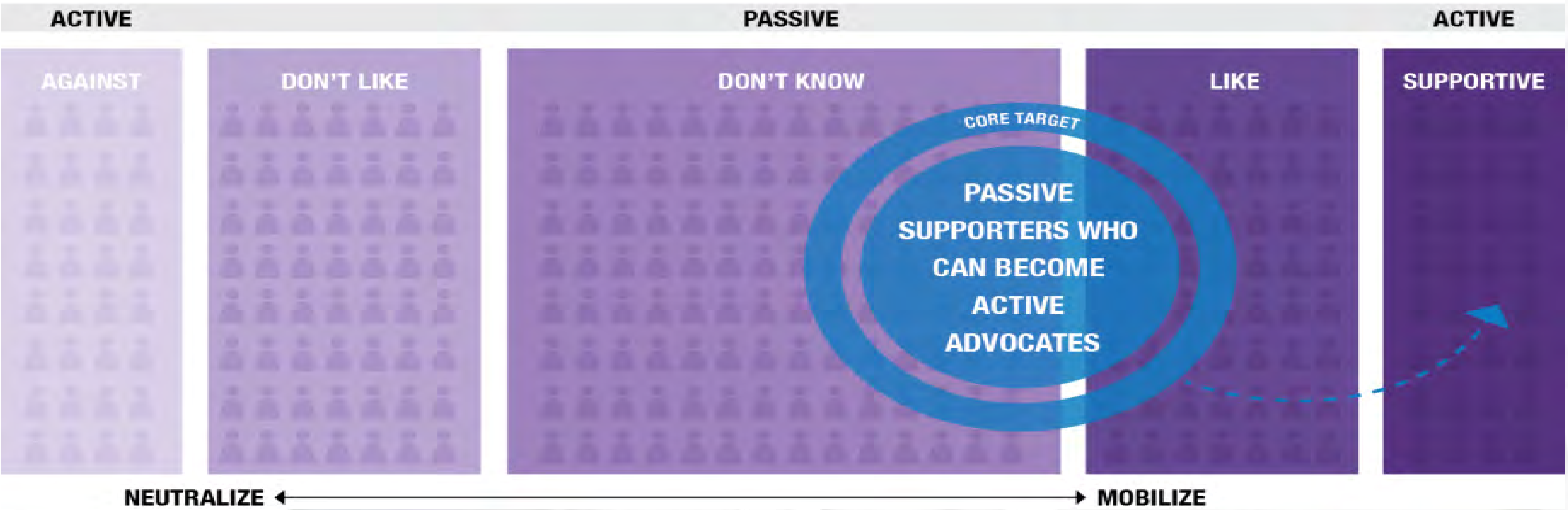

WHY
HOW
WHAT


People don’t buy WHAT we do
They buy WHY we do it.

“High Concern/Low Trust” Issues

- Emotion often trumps rational thought
- You must first gain trust before you are believed
- Empathy and emotion must precede “the facts”
- More basic communications – fewer, shorter responses
- Work to “put things in context” – lend a broader perspective

WE HAVE THE TOOLS AND SUPPORT FOR DAIRY IS HIGH, BUT ADVOCACY IS LOW.



WE NEED TO DO MORE…NOW!

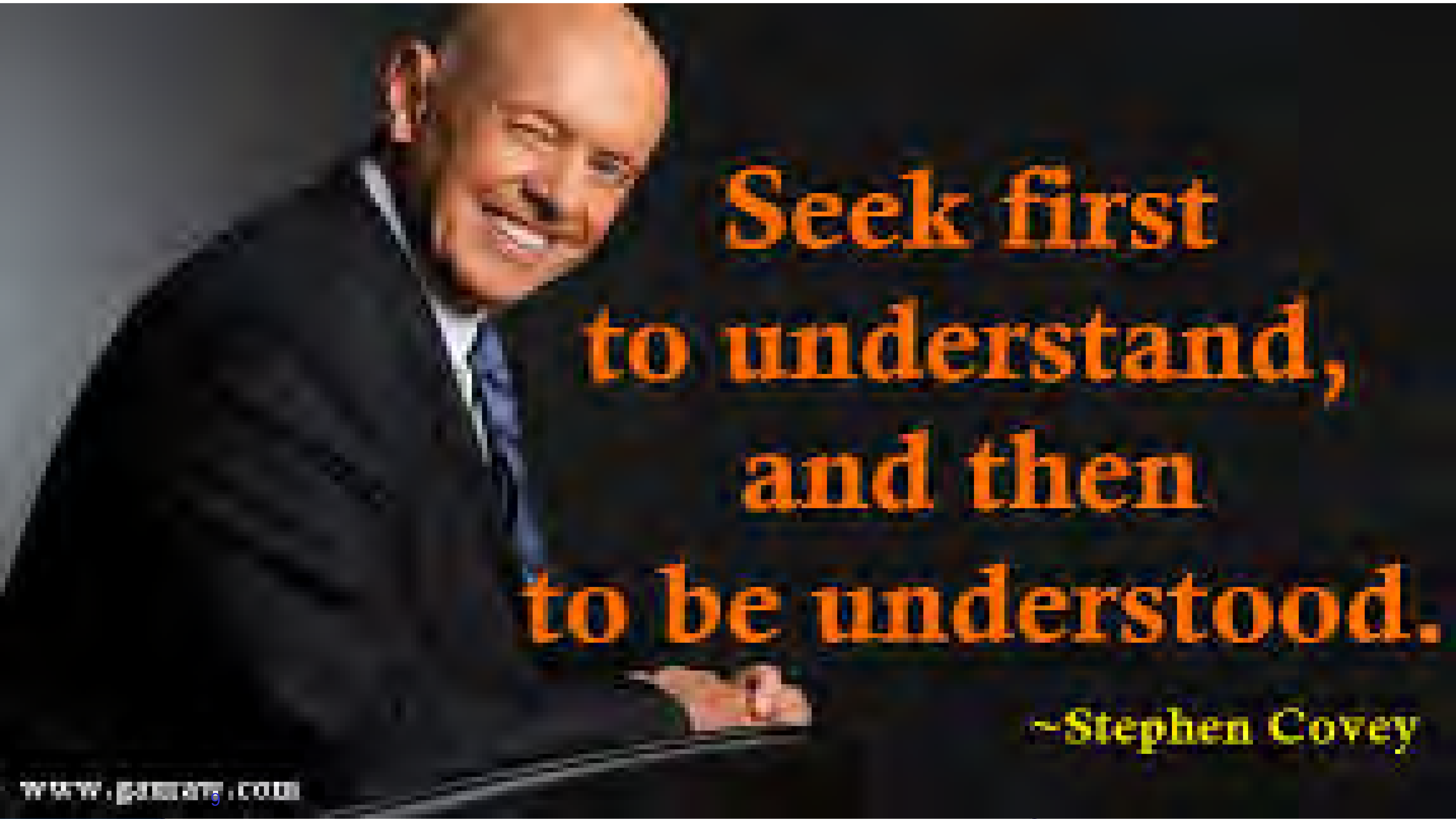
Customer Profile

Love Us & always will

Haven't made up their mind

Respond to whoever they last talked to

Don't like us and never will


Seek first
to understand,
and then
to be understood.
~Stephen Covey

Edelman

Edelman trustbarometer 2015 | ANNUAL GLOBAL STUDY

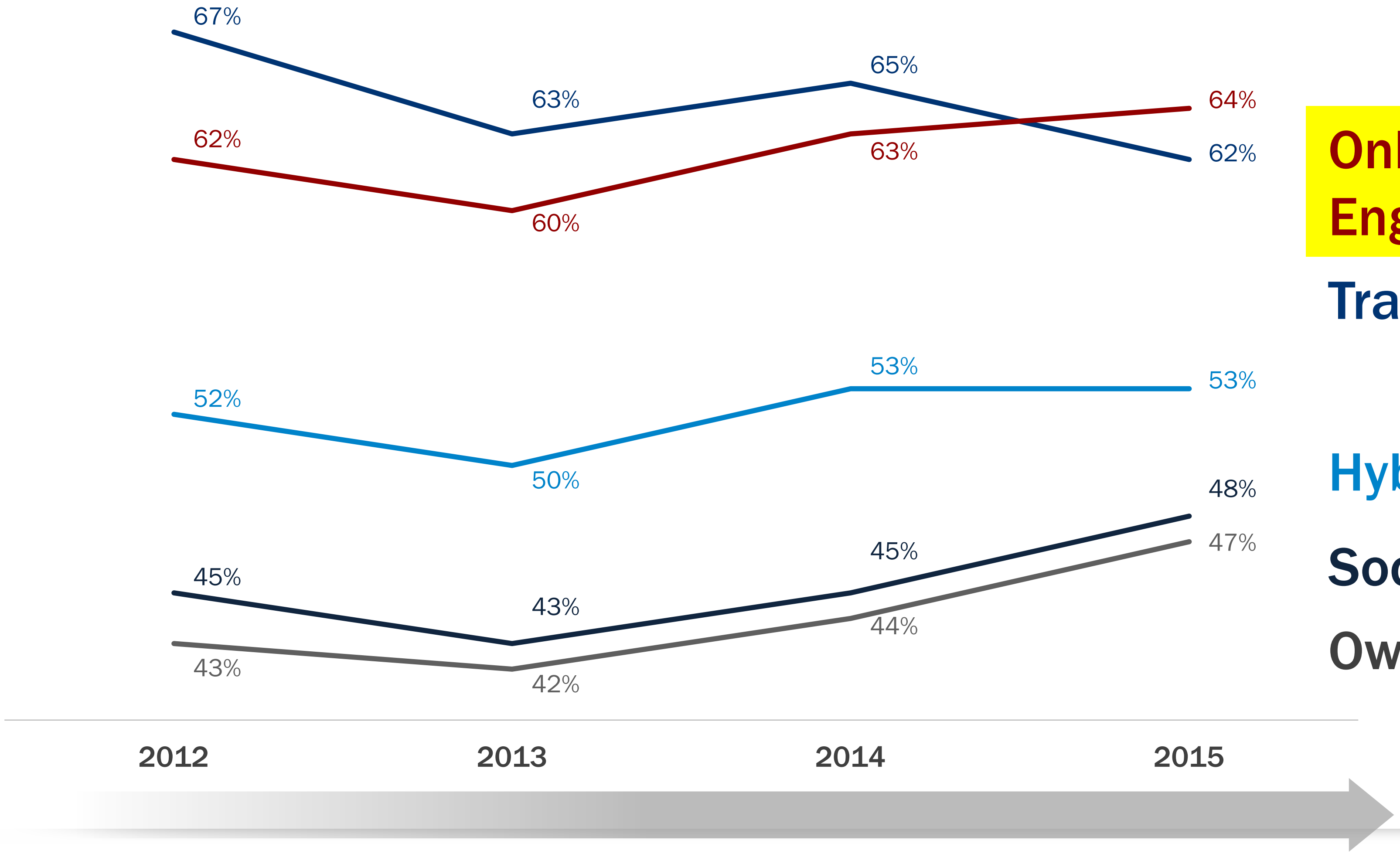
EDELMAN TRUST BAROMETER

2015

THE EVAPORATION OF TRUST: NGOS, BUSINESS, MEDIA ALL DECLINE

MEDIA SOURCES: SEARCH ENGINES NOW MOST TRUSTED

TRUST IN EACH SOURCE FOR GENERAL NEWS AND INFORMATION



Millennials Are Even More Trusting of Digital Media

Online Search Engines	**72%** (+8)
Traditional Media	**64%** (+2)
Hybrid Media	**63%** (+10)
Social Media	**59%** (+11)
Owned Media	**57%** (+10)

Q178-182. When looking for general news and information, how much would you trust each type of source for general news and information? Please use a nine-point scale where one means that you “do not trust it at all” and nine means that you “trust it a great deal.” (Top 4 Box, Trust) Informed Publics, 20-country global total.

All the Rules have Changed

Consumers Expect More Than Good Food

Expect Us to Treat Animals, Workers & Environment Well

Have a Different View – Demand Transparency

They Seek and have Unfettered Access to Information

We Must Intercept Groups Organized Against Us

We Must Adopt a New Attitude and Tools

GROWING DISCONNECTION FROM AGRICULTURE, LEADING TO SKEPTICISM

47%

Only 47% believe farming is performed in a responsible way

40%

40% believe U.S. farmers take good care of the environment

33%

Only 33% believe livestock are treated in a humane manner

How much do you agree or disagree with the statements below?

Most Adults Want to ask Dairy Farmers About Farming Practices

Would you have questions for the dairy farmers about their dairy practices?

No 47%

Yes 53%

N= 1,519

What would you ask a Dairy Farmer?

Top Question Topics	% of Total Adults
• Animal Treatment/Care	21%
• Animal Living Conditions	5%
• How Often Milked	10%
• About Food/Grazing	11%
• Milk Safety Procedures	37%
• Process on Farm	4%

What Drives Consumer Trust?

Shared values are 3-5x more important in building trust than demonstrating competence

Trust research was published in December 2009 - Journal of Rural Sociology

NATIONAL DAIRY BOARD

UNITED DAIRY INDUSTRY ASSOCIATION™

Sharing Your Core Story:

- **Stay Authentic –** Tell your story based on your own experience and expertise, not canned responses**.**

- **Be Values-Based –** Say WHY you're passionate about dairy, and <u>what you stand for</u> (e.g. commitment to delivering a safe, wholesome, nutritious products, caring for our animals & land)
-
- **Be relevant to your audience –** Use examples that connect
- **Identify and connect with shared values**
- **Show confidence &** Stay positive by sharing heartfelt stories

What is a Core Story?

A Reason to Listen

A Reason to Trust

A Reason to Believe

Start With Why!

Beginning with What: “Our cows are fed scientifically balanced diets that help them produce more high quality milk. They also see a veterinarian weekly because we care for our cows and well-cared for cows produce more milk and that enables us to stay in business”.

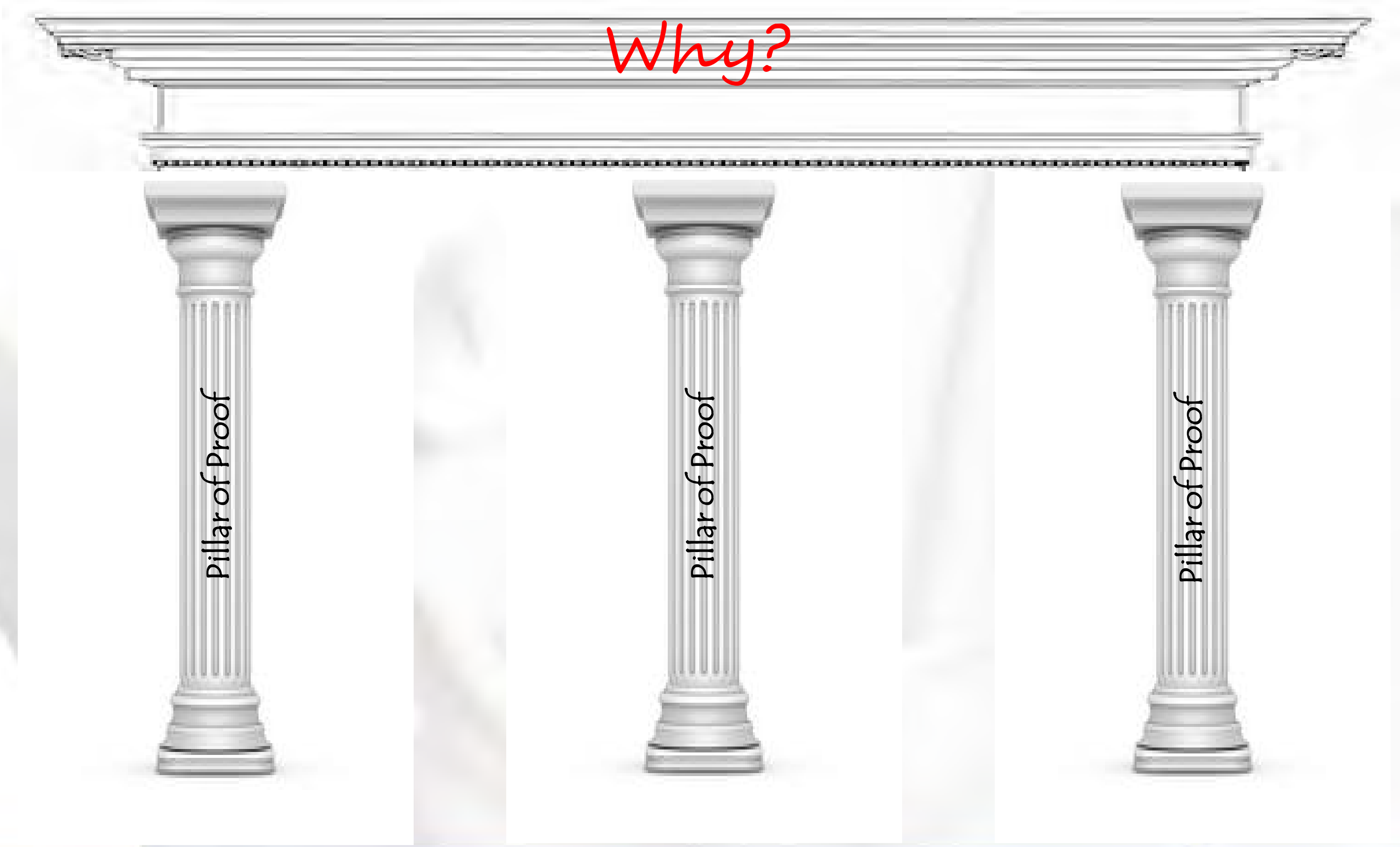
Beginning with Why: “Our family is dedicated to providing the best milk and dairy products for you and your family. We believe we must continuously improve the quality and safety of our products and how we care for our cows and the land entrusted to us because it’s the right thing to do. We’d love for you to visit us”.

Two Perspectives

1. Your telling one of your dairy farm customer's story to a friend, neighbor or family member.
   - Why can they trust dairy farmers & consume milk confidently?
   - Purpose/Belief/Cause
   - Your building confidence in dairy.
2. Your telling your DHIA story to a customer/prospect.
   - Why can they rely on your people and services?
   - Purpose/Belief/Cause
   - How do you add value to their business?
   - You're building customer confidence or your business case

Developing Values-Based Messages

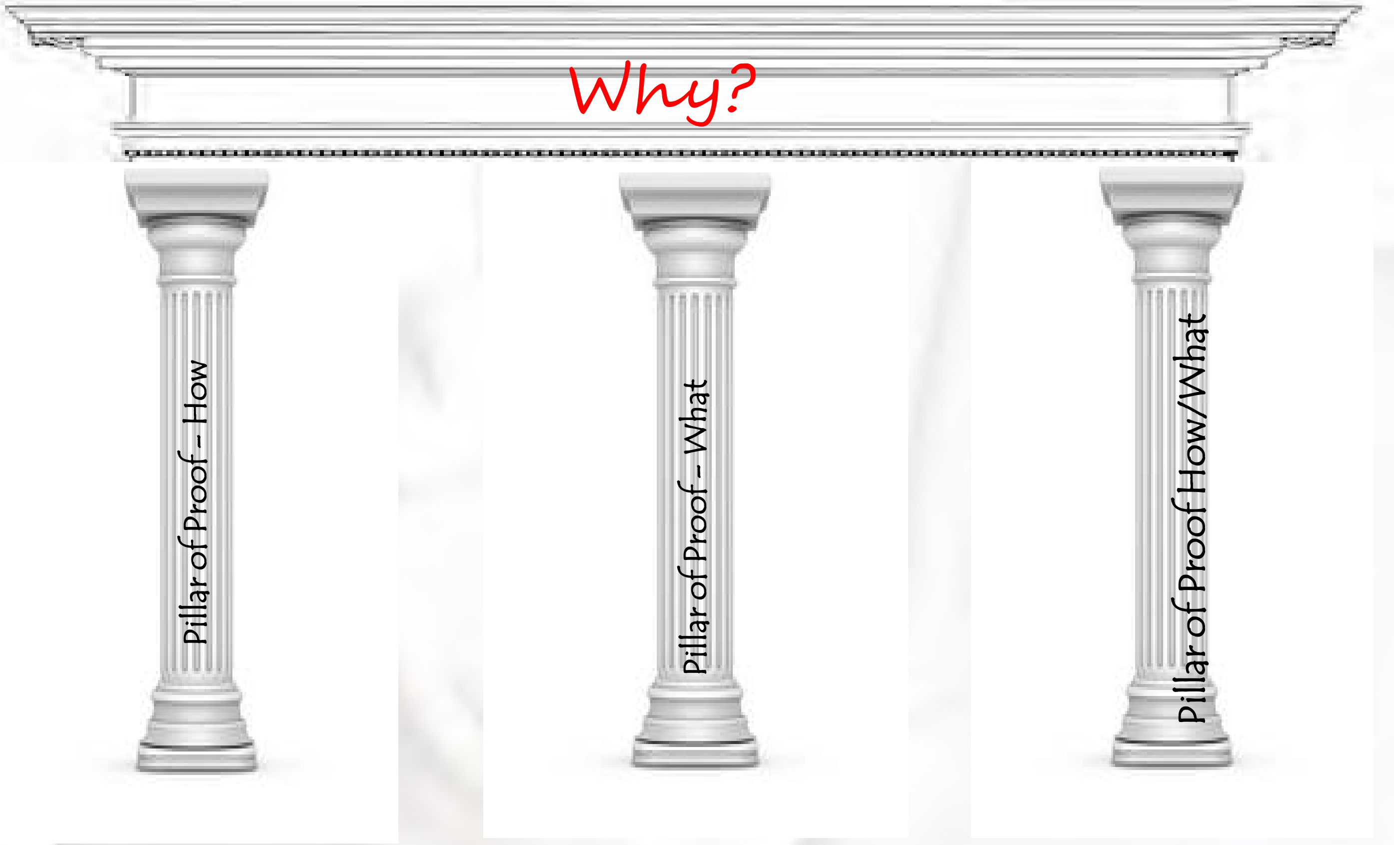
Dairy Farmers Care for their Animals



Developing Values-Based Messages

__________ DHIA adds value to your farm's business

____



How will you begin your message? Why?

What are the key words or phrases you want to make sure you communicate?

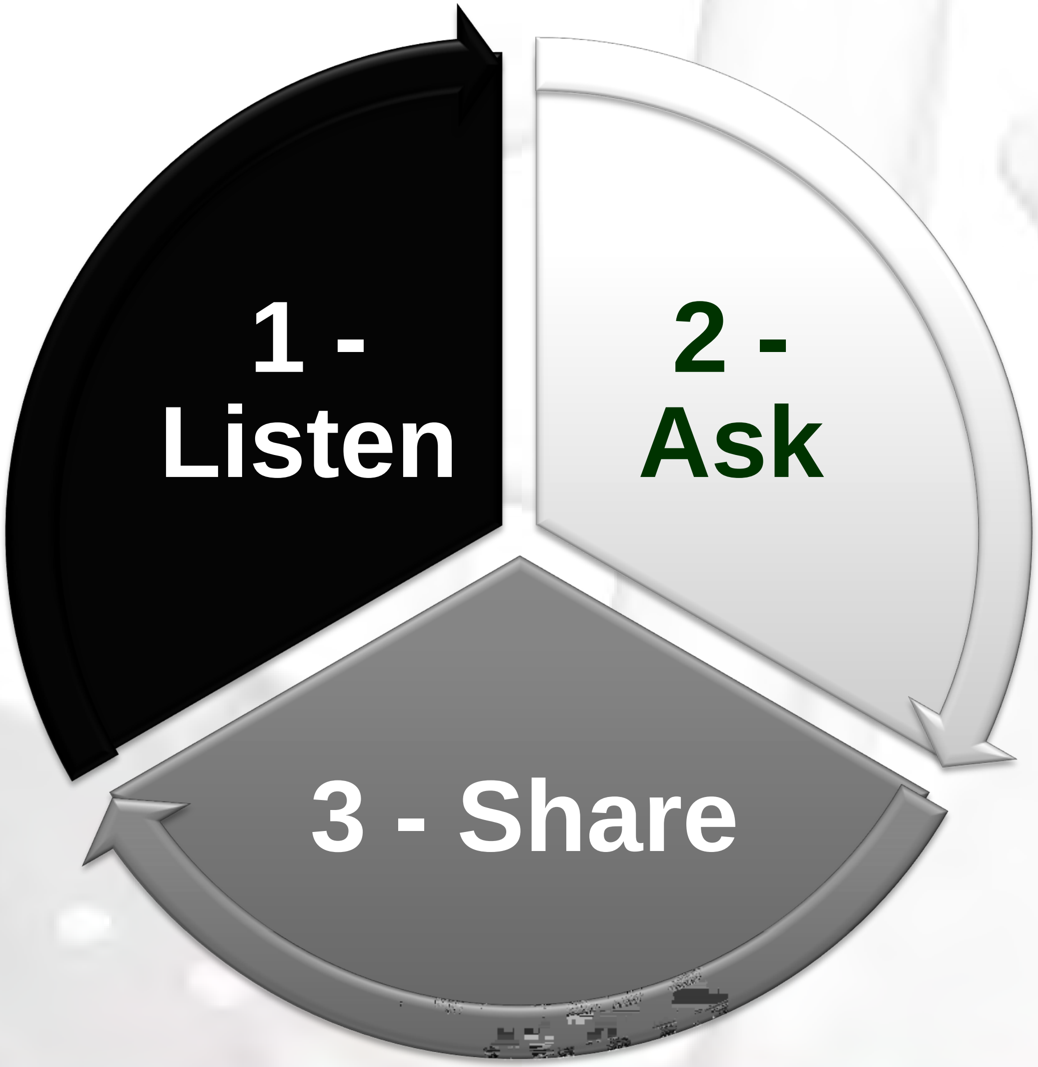
What is your key message?

Your supporting statements (pillars of proof) are:

Answering Difficult Questions

- **Listen first**, before forming your response.
- Look to establish Common Ground
- **Ask clarifying questions**, to learn what the questioner really wants to know.
- **Make it a conversation**, rather than just trying to communicate YOUR ideas.
- **Share your thoughts**, instead of trying to educate.
- **“Swim in Your Own Lane”**– don’t try to give detailed answers on topics you know little about
- **Don’t ever Speculate**

Three Steps to Engaging Effectively



TOO MANY MESSAGES

Healthy people. Healthy planet. Healthy communities.

Your milk comes from a good place.

INNOVATION CENTER FOR U.S. DAIRY.

Dairy checkoff works!

Nutrition Explorations
Kids' Nutrition at Its Best.

Fresh from the farm to you.

Always good.

Healthy all over.

FUEL UP TO Play 60

Our milk.
Our cows.
Our land.

From farm to fridge.

From our family to yours.

NMPF
NATIONAL MILK PRODUCERS FEDERATION

REAL

got milk?

GET FIT WITH got milk?

Real tastes really good.

NATIONAL DAIRY COUNCIL
THE DAIRY CONNECTION

the dairy report
news, analysis and opinion on nutrition and health research.

USA

More ways from farm to table.

The best of our farms to you

Our earth.
Our Products.
Our passion.

People behind the product.

Discover what dairy delivers.

Our Land, Our Cows, Our Passion.

It's farmalicious.

Wholesome. Healthful. Pure.

Http://mydairy.dairy.org

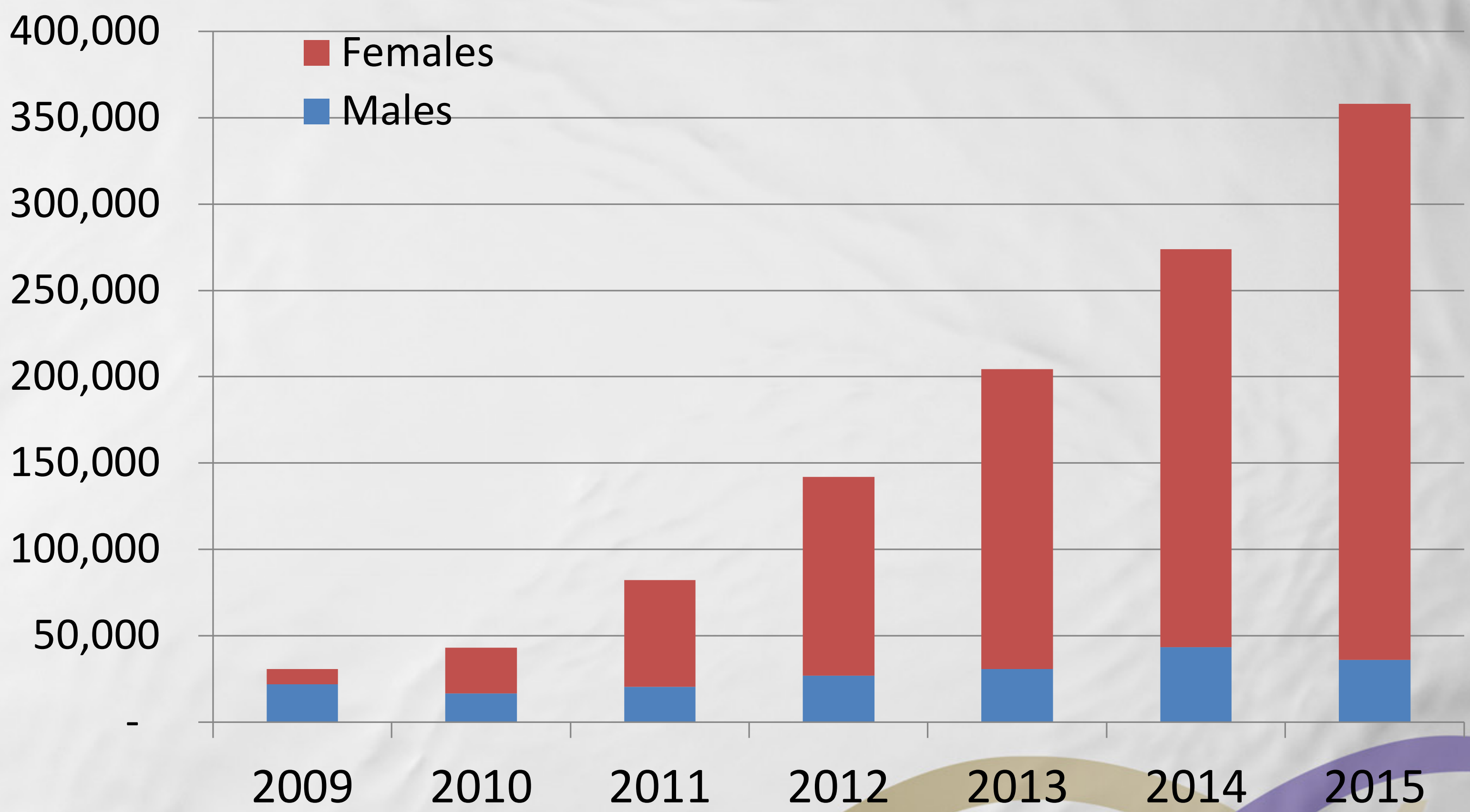
https://amplification.dairygood.org/

WHAT'S NEW IN DAIRY GENOMICS

Cheryl Marti, MS, MBA
U.S. Dairy Franchise Lead & Genetics and Reproduction Marketing

March 2016

INDUSTRY GENOMIC TESTING – ANNUAL TOTALS



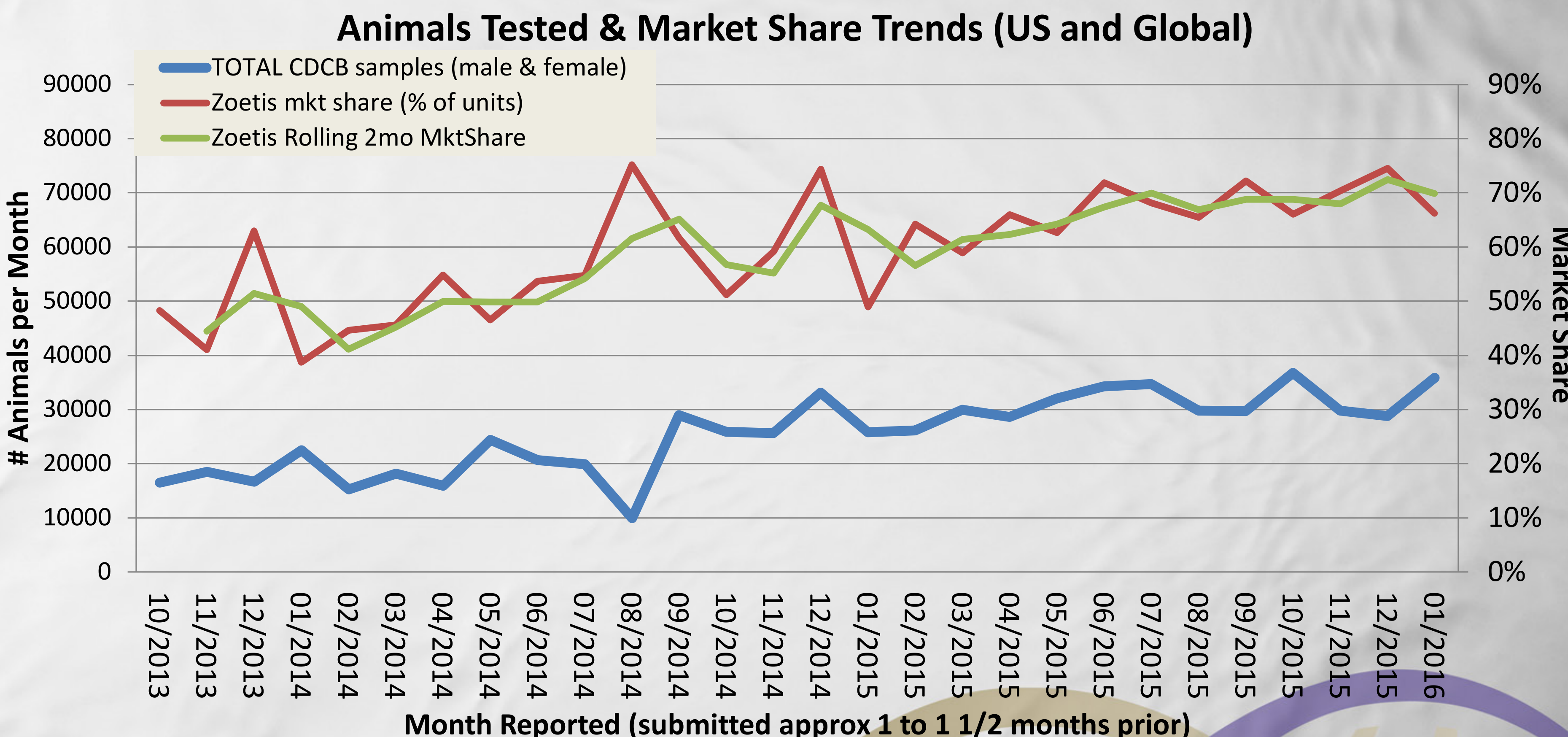
https://www.cdcb.us/Genotype/counts.html

***Thru Dec. 2015**

CLARIFIDE plus

zoetis

MARKET TESTING NUMBERS AND ZOETIS SHARE CONTINUES TO GROW



https://www.cdcb.us/Genotype/counts.html

***Thru Jan. 2016**

CLARIFIDE plus

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HEADLINES: Holstein is ‘invisible cow': Trouble-free animal nears lifetime milk record in just 10 lactations

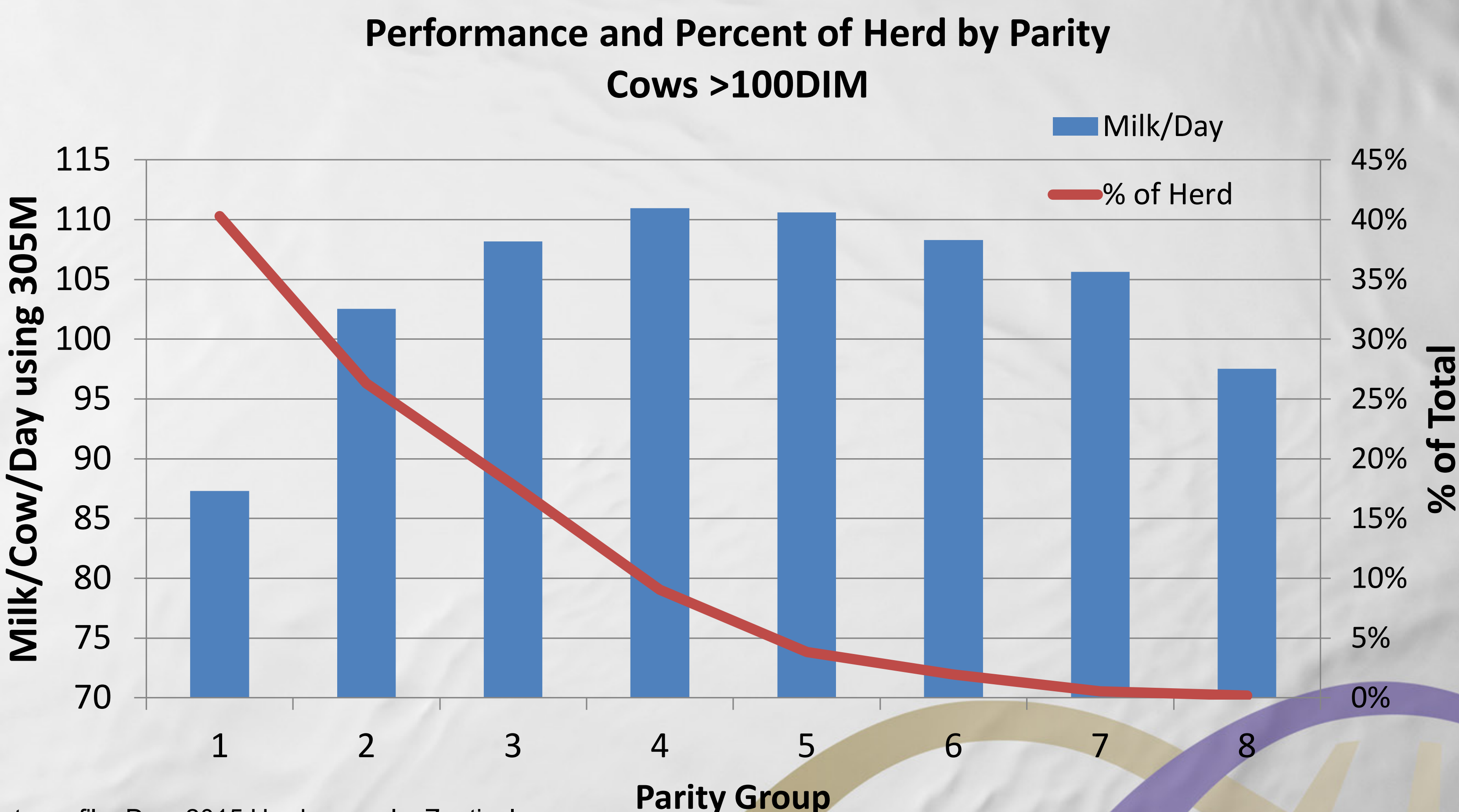
Photo & Story: Heidi Clausen, Country Today

Betzoldvale Scott Mar

- 11-year-old Holstein has produced 348,450 pounds of milk in her lifetime (as of May 2011)
- Became pregnant on her first service insemination every year

www.thecountrytoday.com/front_page/article_ec780704-86d1-11e0-8571-001cc4c002e0.html; Accessed January 2, 2016

LONGEVITY-DRIVEN PROFIT



Data on file, Dec. 2015 Herd example, Zoetis, Inc.

CLARIFIDE® plus

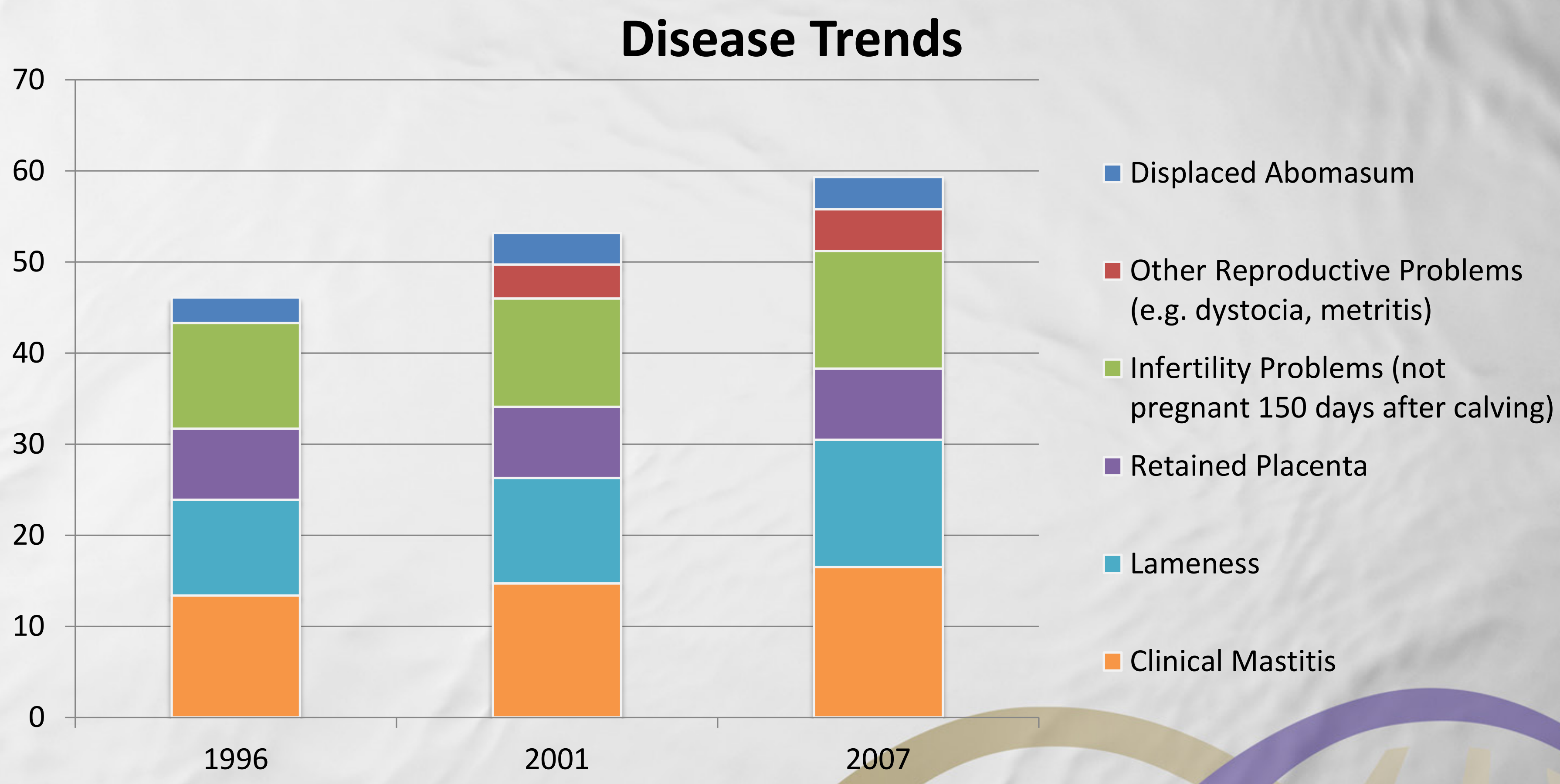
zoetis

IMPACT OF MORBIDITY IS SIGNIFICANT IN DAIRY COWS

	Incidence per Lactation Range	Cost ($) per Case	Culling Risk[1] (%)
Displaced Abomasum	3-5% [1,2,3,4,13]	$494 [4]	26.9
Ketosis	5-14% [1,3,4,13]	$117-289 [4,5]	32.5
Lameness	10-48% [2,4,6,13]	$177-469 [4,7]	16 [2]
Mastitis	12-40% [1,2,3,4,8,13]	$155-224 [4,8,9]	32.7
Metritis	2-37% [1,3,10,11,13]	$300-358 [10,11]	17.1
Retained Placenta	5-15% [1,2,3,4,11,12]	$206-315 [4,12]	31.7

[1] Grohn, Y. et al. 1998. Effect of Diseases on the Culling of Holstein Dairy Cows in New York State. J. of Dairy Sci, 81(4):966-978.
[2] USDA. 2008. Dairy 2007, Part II: Changes in the U.S. Dairy Cattle Industry, 1991–2007 USDA-APHIS-VS, CEAH. Fort Collins, CO #N481.0311.
[3] Bar, D., et al. 2007. Effect of repeated episodes of generic clinical mastitis on milk yield in dairy cows. Journal of dairy science 90(10):4643-4653.
[4] Guard, C. 2009. The costs of common diseases of dairy cattle. Central Veterinary Conference Proceedings. Kansas City, MO..
[5] McArt, J.A. et al, 2015. Hyperketonemia in early lactation dairy cattle: a deterministic estimate of component and total cost per case. J. of Dairy Sci. 98(3):2043-2054.
[e] Bicalho, R.C. Lameness in Dairy Cattle: A debilitating disease or a Disease of Debilitated Cattle? Western Dairy Management Conference, 2011. Pg 73-83.
[7] Cha, E. et al. 2010. The cost of different types of lameness in dairy cows calculated by dynamic programming. Preventive veterinary medicine 97(1):1-8.
[8] Cha, E, et al. 2014. Optimal insemination and replacement decisions to minimize the cost of pathogen-specific clinical mastitis in dairy cows. Journal of dairy science 97(4):2101-2117.
[9] Cha, E, et al. 2011. The cost and management of different types of clinical mastitis in dairy cows estimated by dynamic programming. Journal of dairy science 94(9):4476-4487.
[10] Overton, M. and J. Fetrow. 2008. Economics of postpartum uterine health. Proc Dairy Cattle Reproduction Council:39-44.
[11] "The Value of Uterine Health: the diseases, the causes, and the financial implications." Dairy Cattle Reproduction Council article.
[12] Guard, C., 1999. Retained Placenta: Causes and Treatments. Advances in Dairy Technology (1999) Vol. 11, page 81.
[13] Zwald, N.R., K.A. Weigel, Y.M. Chang, R.D. Welper and J.S. Clay. 2004. Genetic selection of Health Traits using Producer-Recorded Data. I. Incidence Rates, Heritability Estimates and Sire Breeding Values. J. of Dairy Sci., 87:4287-4294.

DAIRY COW MORBIDITY TRENDS



USDA. 2008. Dairy 2007, Part II: Changes in the U.S. Dairy Cattle Industry, 1991–2007 USDA-APHIS-VS, CEAH. Fort Collins, CO #N481.0311.

CLARIFIDE® plus

First commercially available dairy genetic evaluation specifically designed for wellness traits in U.S. dairy cattle

zoetis

CLARIFIDE® PLUS FOR HOLSTEINS

CDCB Official Evaluation

- Parentage
- Production
- Reproduction
- Health
- Type

Wellness Traits

- Mastitis
- Lameness
- Metritis
- Retained Placenta
- Displaced Abomasum
- Ketosis

Genetic Conditions

- Polled (no fee)

- Milk Components
- Infertility Haplotypes
- Other genetic conditions*

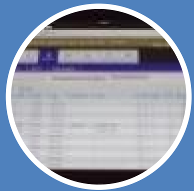
DWP$™ Animal Ranking

* CVM, Brachyspina and Beta Casein A2 available with add-on fee.

CLARIFIDE® plus

zoetis

CREATING WELLNESS TRAIT GENOMIC PREDICTIONS



Data

Genotypes

Pedigrees

Zoetis has the resources to bring these components together

POWER OF THE DATA BEHIND CLARIFIDE® PLUS

Trait	No. records in GE
Mastitis (MAST)	4,267,826
Lameness (LAME)	3,744,435
Metritis (METR)	3,078,504
Retained Placenta (RETP)	3,479,000
Displaced Abomasum (DA)	3,131,012
Ketosis (KET)	1,995,574
Pedigree	15,616,182
Genotypes	105,152

Number of records available after cleaning and editing in August 2015
Over 10M lactations

Source: Data on file, Zoetis internal data, August 2015, Zoetis Inc.

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MILLIONS OF RECORDS AND SINGLE STEP CONTRIBUTE TO AVERAGE RELIABILITIES OF 49 OR HIGHER

Trait	Reliabilities (%) of young genotyped and pedigreed females	
	GPTA Reliability	Traditional Parent Average Reliability
MAST	**51**	19
LAME	**50**	18
METR	**49**	17
RETP	**50**	17
DA	**49**	16
KET	**50**	16

29,901 heifer observations (<2 years old)

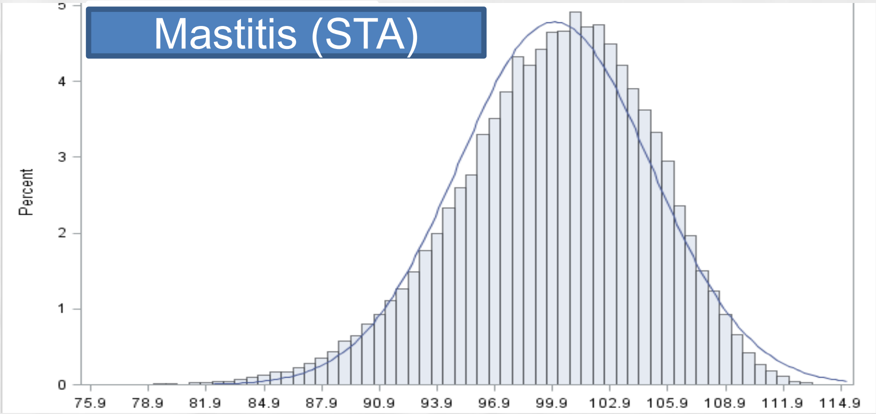
Reliabilities are similar or better than Reliability of some core CDCB traits (i.e. HCR & DSB)

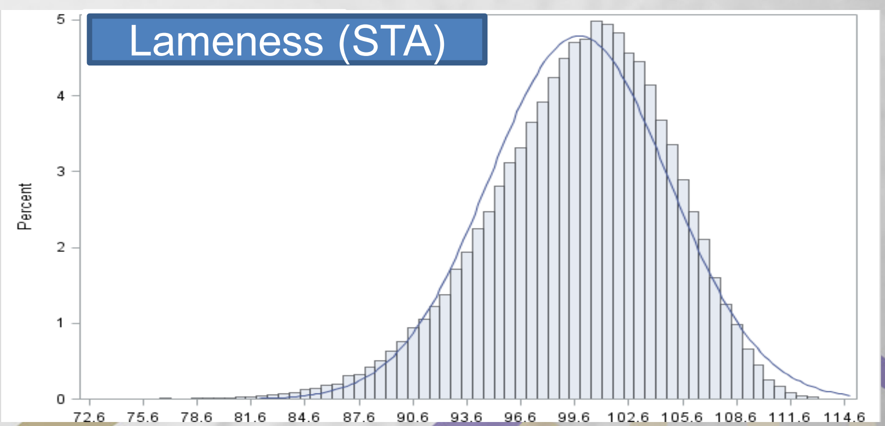
Source: Data on file, Zoetis internal data, August 2015, Zoetis Inc.

GENOMIC PREDICTIONS FOR WELLNESS TRAITS SHOW GREAT GENETIC VARIATION EXISTS

Wellness traits are expressed as a standardized transmitting ability (STA)

Wellness Trait	Average	Standard Deviation	Minimum (Worst)	Maximum (Best)
Mastitis	100	5	76	115
Lameness	100	5	73	115
Metritis	100	5	75	115
Retained Placenta	100	5	71	116
DA	100	5	69	111
Ketosis	100	5	72	113





Source: Data on file, Zoetis internal data, August 2015, Zoetis Inc.

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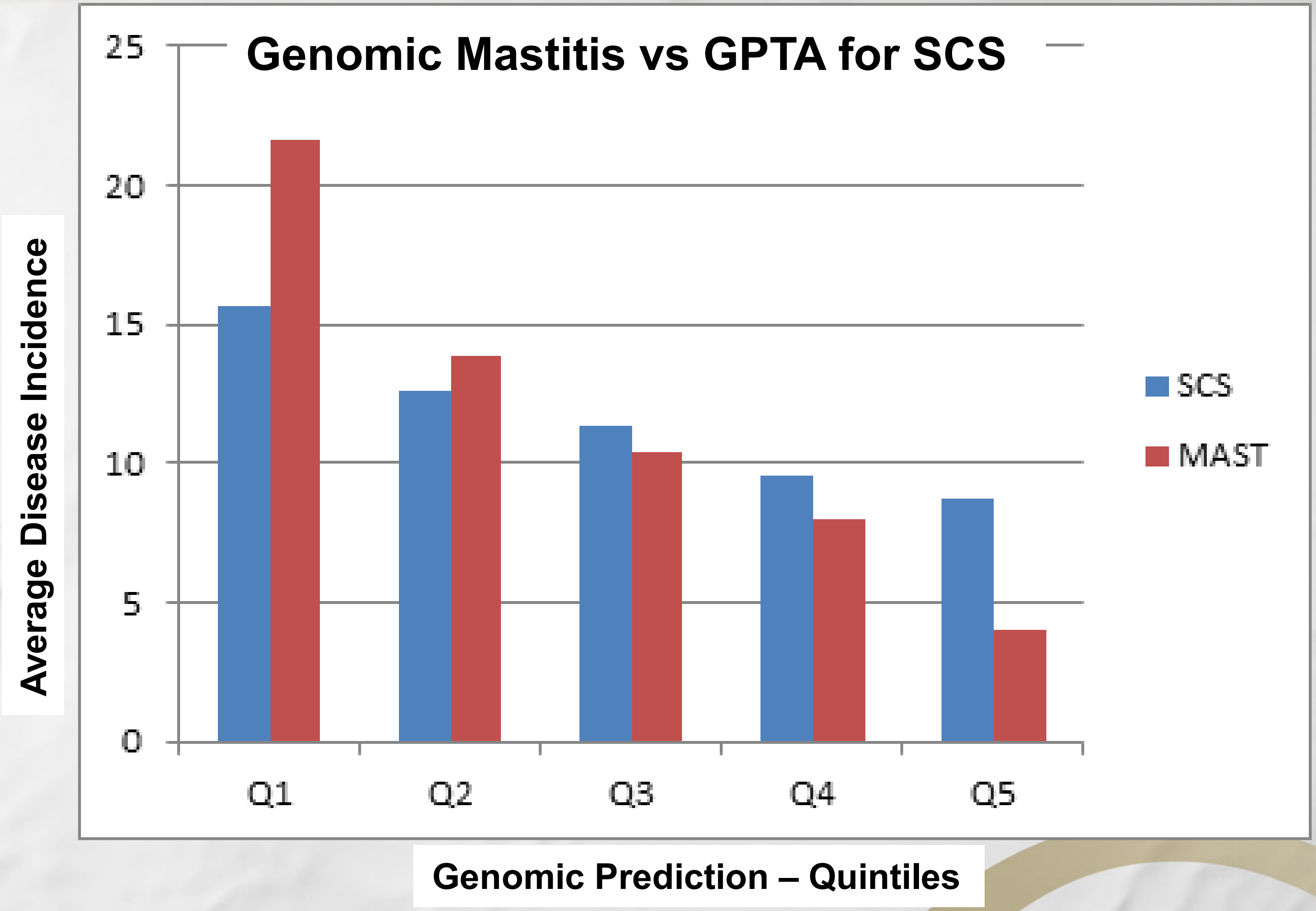
ACHIEVING MORE GENETIC PROGRESS - DIRECT SELECTION IS BEST

- To make the most genetic and phenotypic progress in a trait, use direct selection, not indirect
- Examples:

Goal	Indirect trait	Direct trait	Estimated correlation
Improve reproduction	PL	Daughter Pregnancy Rate (DPR)	0.64
Reduce mastitis cases	SCS	New genomic Mastitis trait	-0.45
Reduce lameness	PL	New genomic Lameness trait	0.28
	FLC	New genomic Lameness trait	0.00
Reduce metritis	PL	New genomic Metritis trait	0.32

Source: Data on file, Zoetis internal data, August 2015, Zoetis Inc.

DIRECT SELECTION IS BEST



- Data includes Ref. Pop. n= 76K
- Not useful for validation purposes since phenotypic records are contributing to the Mastitis Prediction
- Good example we can expect from the validation data of how direct selection is best

Source: Data on file, Zoetis internal data, August 2015, Zoetis Inc.

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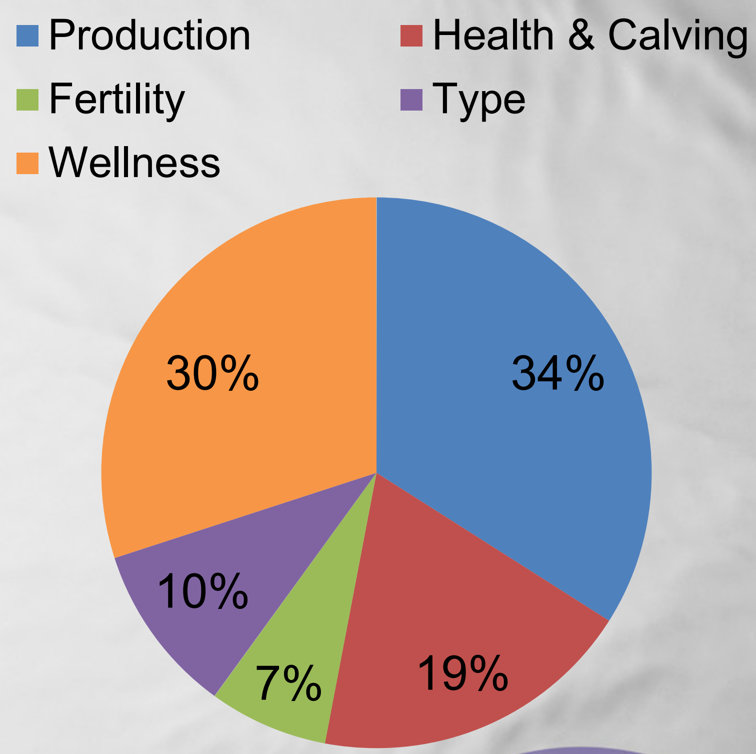
DAIRY WELLNESS PROFIT INDEX™ (DWP$™)

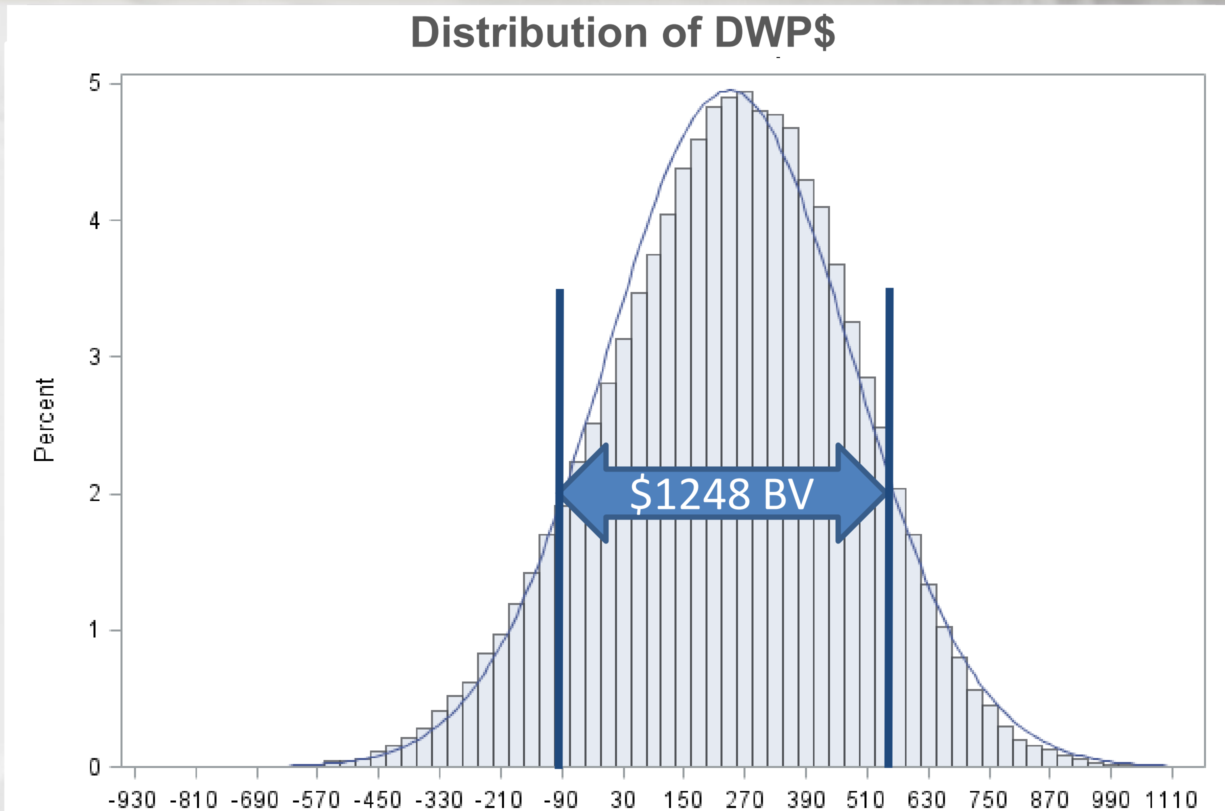
- Comprehensive selection index
  - Production, reproduction, health, type, wellness and polled
- Economic index describing differences in lifetime profitability
  - Same economic assumptions as Net Merit (NM$) for core traits
  - Economic values from scientific literature for wellness traits
  - Economic incentive for selection of animals with polled genotype



DWP$ STATISTICS

- Higher DWP$ is more desirable, indicating a genetically more profitable animal overall

Mean	238
Standard Deviation	242
10th Percentile	-83
90th Percentile	541



Over $1200 difference between top and bottom 10th percentile animal in DWP$ performance (BV-based)

Source: Data on file, Zoetis internal data, August 2015, Zoetis Inc.

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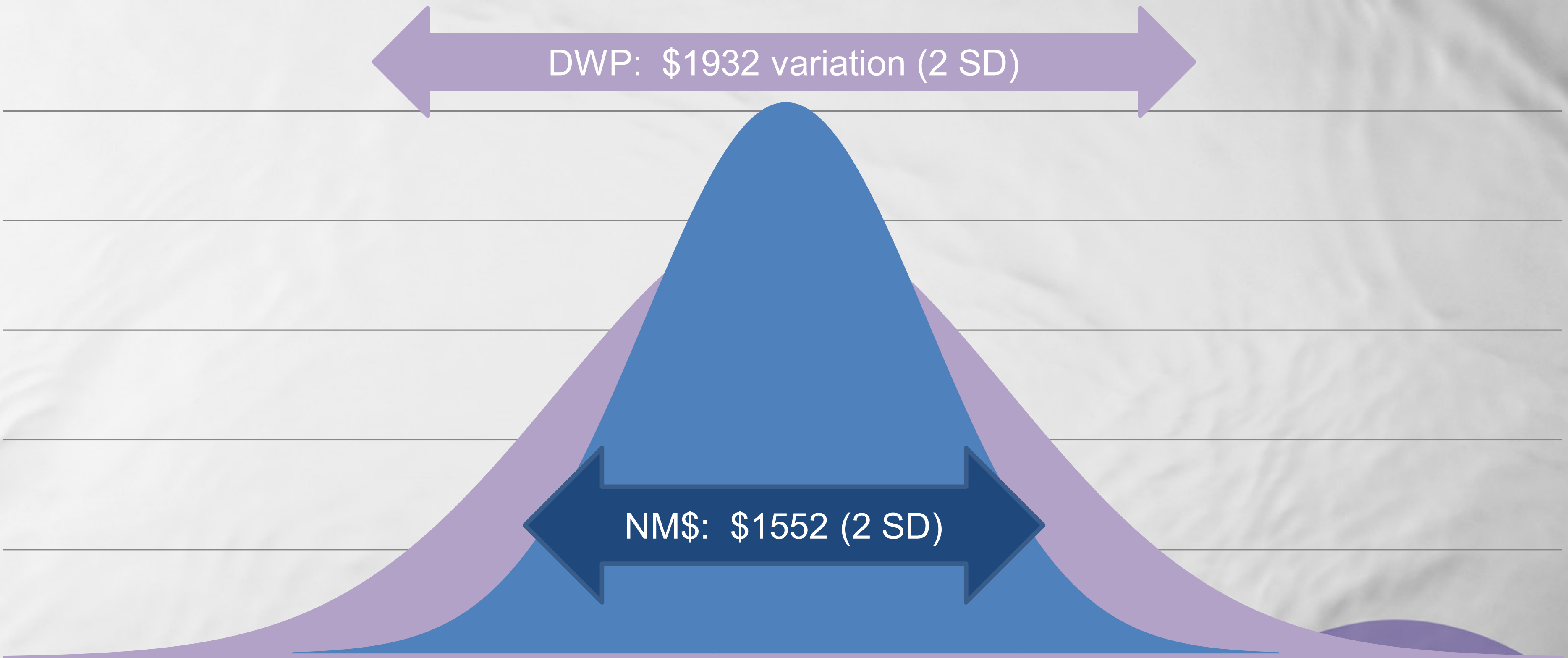
DWP$ DESCRIBES MORE GENETIC VARIATION IN PROFITABILITY, LEADING TO MORE GENETIC PROGRESS

$$\frac{\text{Gen. Progress}}{\text{Year}} = \frac{\textbf{Accuracy} \times \text{Selection Intensity} \times \textbf{Genetic Variation}}{\text{Generation Interval}}$$



NM$ Breeding Value SD = $388
DWP$ Breeding Value SD = $483

Data on file, Dec. 2015 Data package, Zoetis, Inc.

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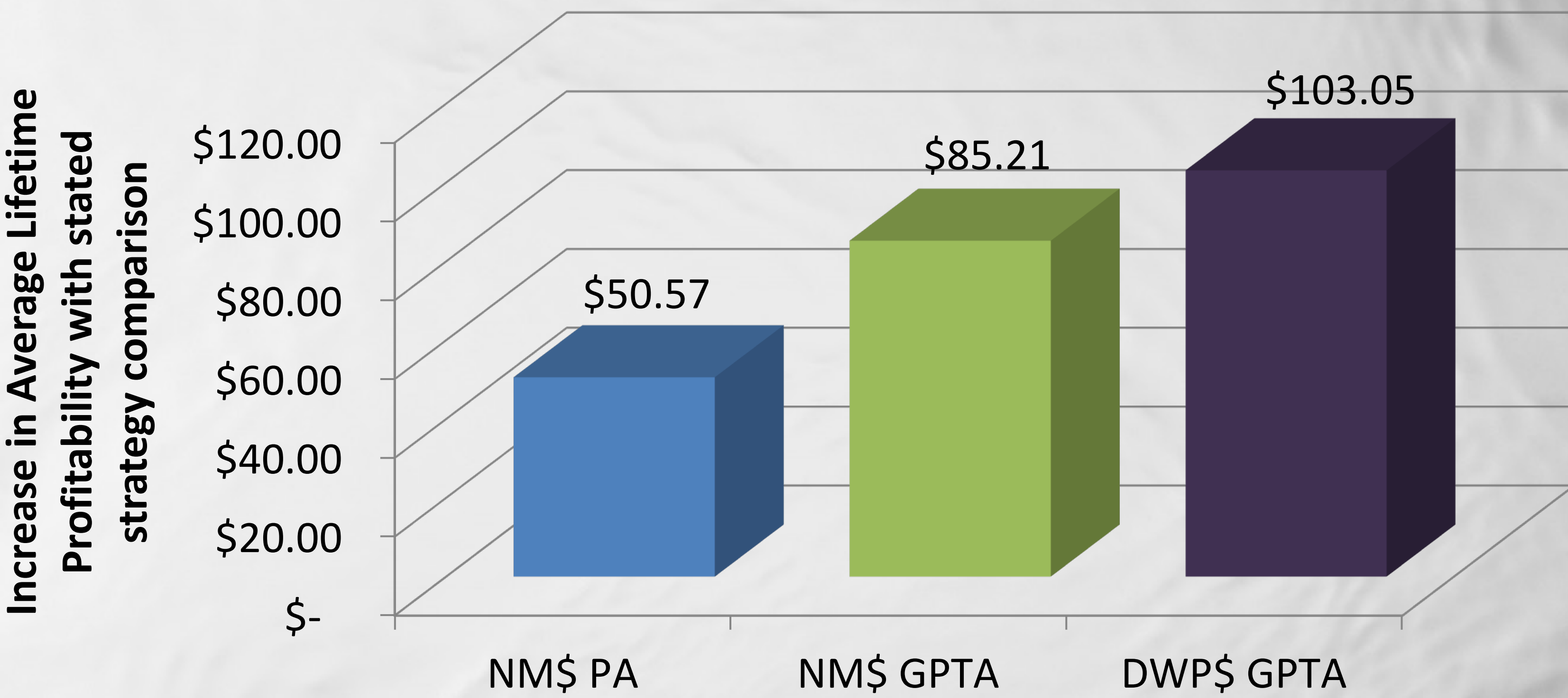
PROFITABILITY RESPONSE TO SELECTION



Assumes selection of top 85% of females as replacements. Does not account for increases in profitability in progeny of selected animals.

This plot compares the estimated increase in lifetime profitability between female genetic selection based on NM$ genomic predictions (CLARIFIDE) and DWP$ (CLARIFIDE PLUS) when selecting the top 85% of heifers to keep as replacements, each estimated relative to no selection strategy ($0).

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CLARIFIDE PLUS LAUNCH MATERIALS

CLARIFIDE plus

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CLARIFIDE PLUS: EDUCATIONAL VIDEOS

CLARIFIDE® plus

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SUMMARY

- CLARIFIDE® Plus is a big step forward for U.S. Holstein producers!
- CLARIFIDE Plus can help producers identify animals with the greatest genetic potential to help reach their wellness and profitability goals
- Millions of records contribute to Reliabilities similar to some existing core CDCB traits, such as HCR and DSB
- Direct selection with wellness traits is better!
- DWP$ is an easy-to-use, comprehensive selection index exclusively available through CLARIFIDE Plus

CLARIFIDE® plus

For More Information:

- www.clarifideplus.com
- Genetics Customer Service 877-233-3362

zoetis

Dairy Australia

A view from down under

Field Service Advisory Committee

8 March 2016

Matt Shaffer

What do we mean by Herd Improvement?

Enabling farmers to make data driven decisions to improve the profitability of their farms

Culling decisions

Bull decisions

Treatment decisions

Trait decisions

Breeding decisions

Cell Count decisions

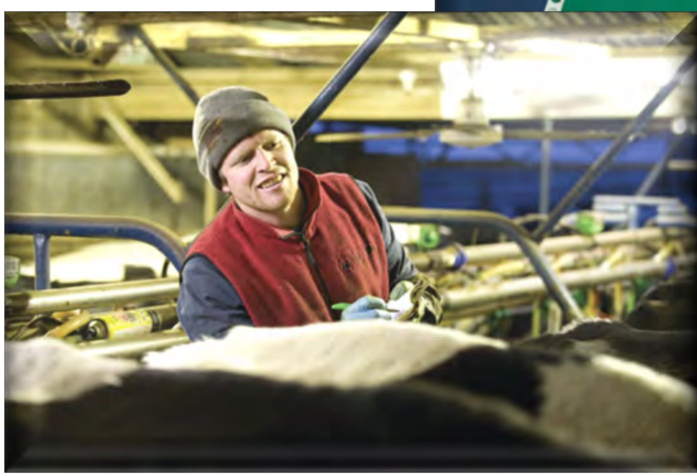
Drying off decisions

Replacement decisions

The need for a strategy

Achieving change

ry agrees to change behaviour



Many individuals and organisations, including more than 30 farmers, contributed time and effort to the strategy development and its ongoing implementation.

Dairy Australia

Dairy farmers maximise their profit through a vibrant herd improvement industry offering effective and highly valued services

- Deliver Profit
- Redesign Oversight
- Demonstrate Value
- Improve Service
- Reset Evaluation
- Develop People

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1. Deliver Profit
- Implement Herd Recording reports, marketing and extension
- Implement Genetic reports, marketing and extension
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Data Flood – Information Drought

32 ltrs

340,000 cells

107 MS

3.7% Fat

32 Months

1.9 milkings

8,454 ltrs

3.2% Protein

294 HWI

30% Conception

349 BPI

97% Jersey

263 TWI

TARGET COWS
NewCo
GLOSSARY OF TERMS
NewCo
Multifarm Pty Ltd
Farm No.7
1234 Back Rd,
Somewhereville VIC 3000
HERD TEST REPORT
NewCo
01/12/2015
REPORT NO: 134570
YOUR DASHBOARD
For each category, the Results column shows the percentage of cows in this test that are of concern. The colour of circle in the Trend column indicates if the percentage of cows raising alerts in each category has improved (green), got worse (red) or remained the same (yellow) from the last test day. The Alert list below suggests management actions you may wish to consider in response to these results.
SINCE LAST REPORT: WORSE SAME IMPROVED
Results Trend
CELL COUNT (ACTUAL) 28%
CELL COUNT (WEIGHTED) 2
CHRONIC MASTITIS 22%
CLINICAL MASTITIS 4%
CALVING TIME MASTITIS – HEIFERS 8%
CALVING TIME MASTITIS – COWS 9%
ACIDOSIS 15%
KETOSIS 45%
FERTILITY 42%
RE-CALVING 55%
YOUR PERFORMANCE MEASURES
Collecting and submitting data enables us to provide a range of useful performance measurements so you can monitor your herd's performance. The trend arrows indicate if the stock numbers are increasing, decreasing or steady since last test day. Note: If there is a performance category below showing a zero – it means we don't have that data from you. Please contact us so we can assist you to gather that information.
Results Trend
HERD SIZE 580
NUMBER MILKING COWS 452
FRESH COWS 75
DRY OFFS 35
CULLING NUMBERS 6
SOLD COWS 12
UNIDENTIFIED SIRES 2
ALERT LIST
CELL COUNT (WEIGHTED)
CALVING TIME MASTITIS – COWS
FERTILITY
CHRONIC MASTITIS
ACIDOSIS
RE-CALVING
CLINICAL MASTITIS
KETOSIS
CALVING TIME MASTITIS – HEIFERS
NOTES
NewCo Pty Ltd
Regional Office
Contact Address #2
123 Your St
Yourtown VIC 3000
Ph: 0414 012 345
Website details
Email details
PAGE 1 OF 3
PAGE 3 OF 3

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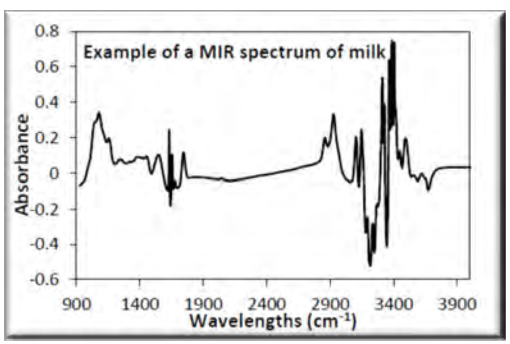
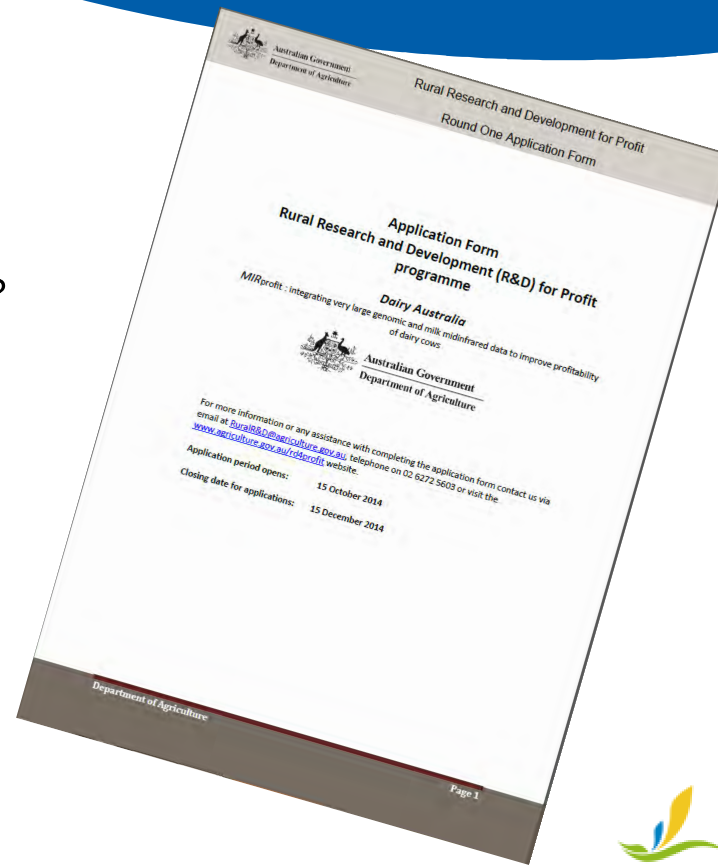
MIR*profit*: New tools



Predictions of:
- Ketosis?
- Acidosis?
- Energy balance?
- Protein utilisation?
- Methane?
- Pregnancy?
- Heat?
- ?



Australian Government
Department of Agriculture

Rural Research and Development for Profit
Round One Application Form

Application Form
Rural Research and Development (R&D) for Profit programme

Dairy Australia

MIRprofit : integrating very large genomic and milk midinfrared data to improve profitability of dairy cows

Australian Government
Department of Agriculture

For more information or any assistance with completing the application form contact us via email at RuralR&D@agriculture.gov.au, telephone on 02 6272 5603 or visit the www.agriculture.gov.au/rd4profit website.

Application period opens: 15 October 2014

Closing date for applications: 15 December 2014

Department of Agriculture

Page 1

Rural Research and Development for Profit
Keeping Australian farmers at the cutting edge

Australian Government
Department of Agriculture

VICTORIA State Government

Australian Dairy Herd Improvement Scheme

cra-w

Université de Liège

DairyFutures CRC

National Herd Improvement Association of Australia Inc. NHIA

teagasc
Agriculture and Food Development Authority

Exploring the potential of MIR

Milk mid infrared spectrometry data available through new Bentley and Foss milk analysers

European algorithms to be tested to interpret the data.

- Energy balance, protein balance, mineral balance
- Feed efficiency
- Metabolic diseases like ketosis
- Fatty acid composition

Large scale data enables possible uses in genetic evaluation.

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Four experiments

- Intensive MIR collection on 120 cows at Ellinbank
- Assembly of MIR samples from varying feeding systems
- 2000 commercial cows with intensive phenotype collection
- 10000 commercial cows with moderately intensive phenotype collection

Communication and Engagement

- Annual MIR workshops for Herd test managers and leading staff 2016-2018
  - the technology
  - the research
  - the business opportunities
- Six monthly email updates
- Follow up interviews to seek feedback
- Public communications – once results available

Good Bulls App: New tools

- ➢**Create** a team of bulls
- ➢**Search** for individual bulls
- ➢**Rank** bulls
- ➢**Filter** bulls
- ➢**Save** bulls
- ➢**Export** bull lists
- ➢**Alert** farmers

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Developing digital strategy

Delivery Tool	Cow Input Tool	Farm Input Tool
Breeding Values	Matings	Financials
Herd Test Dash Board	Cavings	Physical Info
Genetic Progress	Health Events	Water
Genetic Futures	Observations	Pasture

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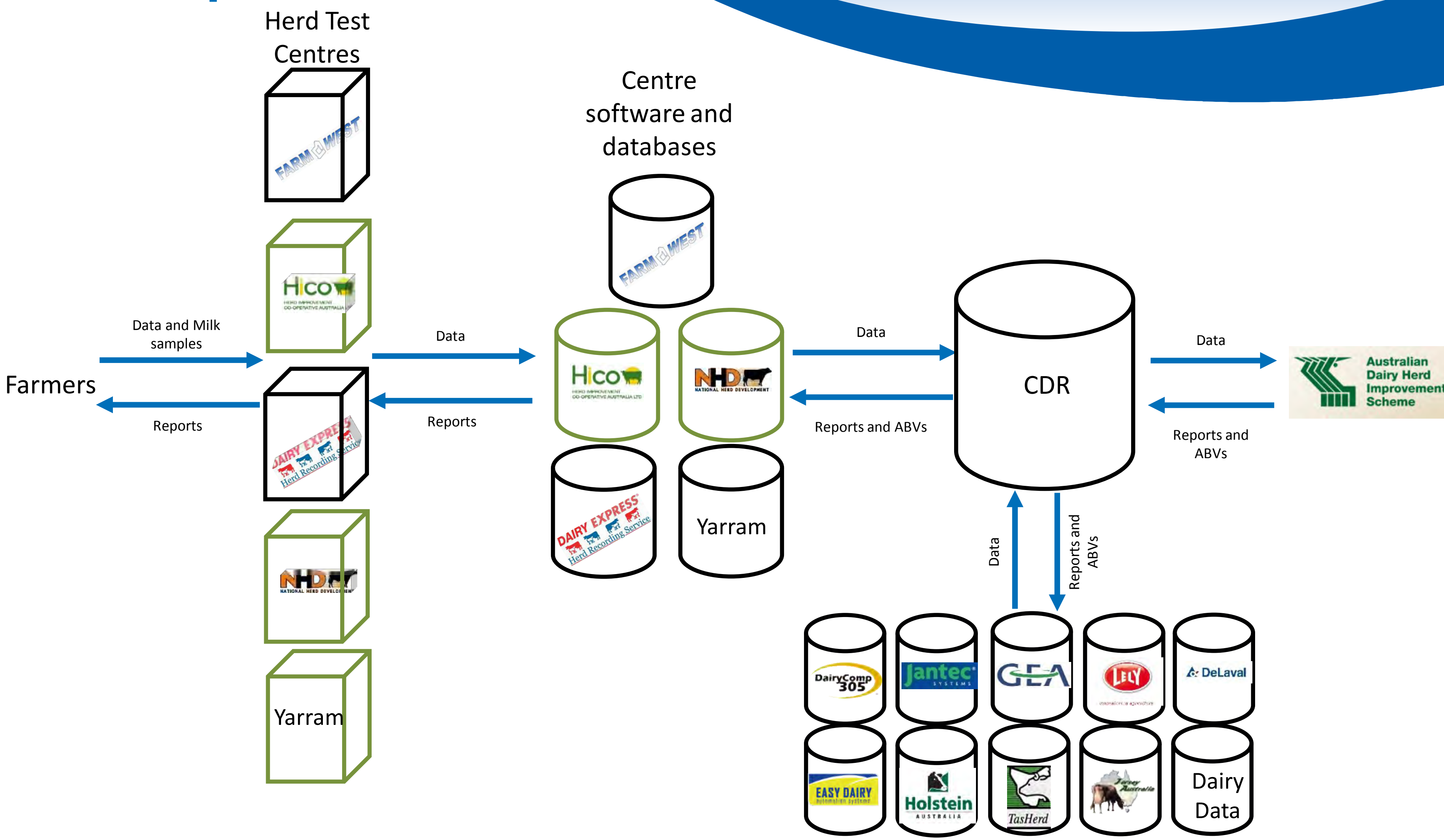
Data, data, data

http://www.plumber-toowoomba.com.au/services/blocked-drains-and-pipes/

Data Map: Central Data



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ImProving Herds: Demonstrating Profit

- Genetics drives farm profit
- Genomic testing of heifers is valuable
- Gains in feed efficiency lead to greater profit and reduced footprint
- Herd testing drives profit

IMPROVING HERDS

GARDINER FOUNDATION | VICTORIA State Government | Australian Dairy Herd Improvement Scheme | NHIA National Herd Improvement Association of Australia Inc. | Teagasc Agriculture and Food Development Authority | DairyFutures CRC | Holstein Australia | INRA Science & Impact | SRUC

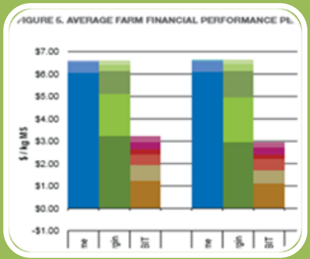
IMPROVING HERDS

Dairy Australia

Retrospective analysis of profit and genetic merit

Genetic Focus Farms

- Demonstrating genomics within herd
- Developing Genetic Futures Report
- Discussion, discovery, sharing



Split herd financial analysis of 25 herds

IMPROVING HERDS

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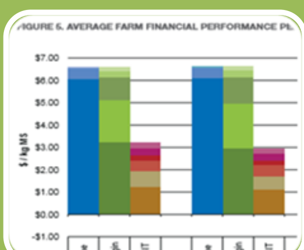
Retrospective analysis of profit and use of herd testing

Herd Test Focus Farms

- Demonstrate how herd testing is implemented
- Discussion, discovery, sharing



Financial analysis of 7 herds

Dairy Australia

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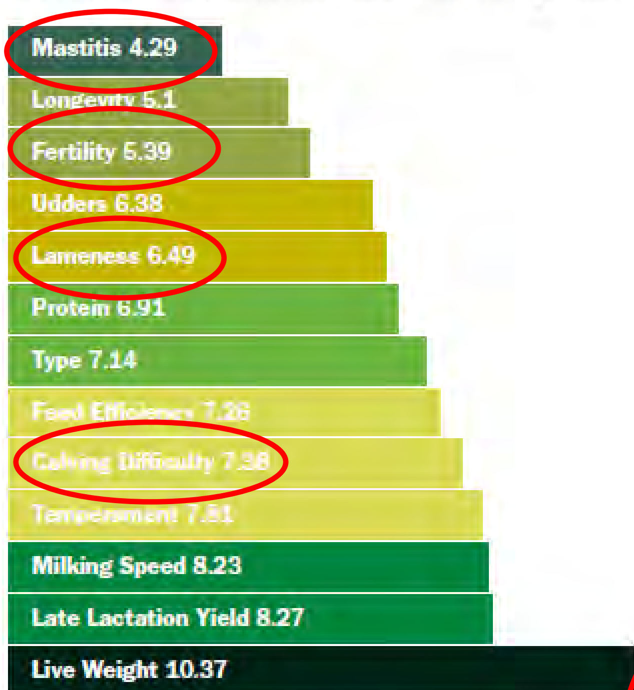
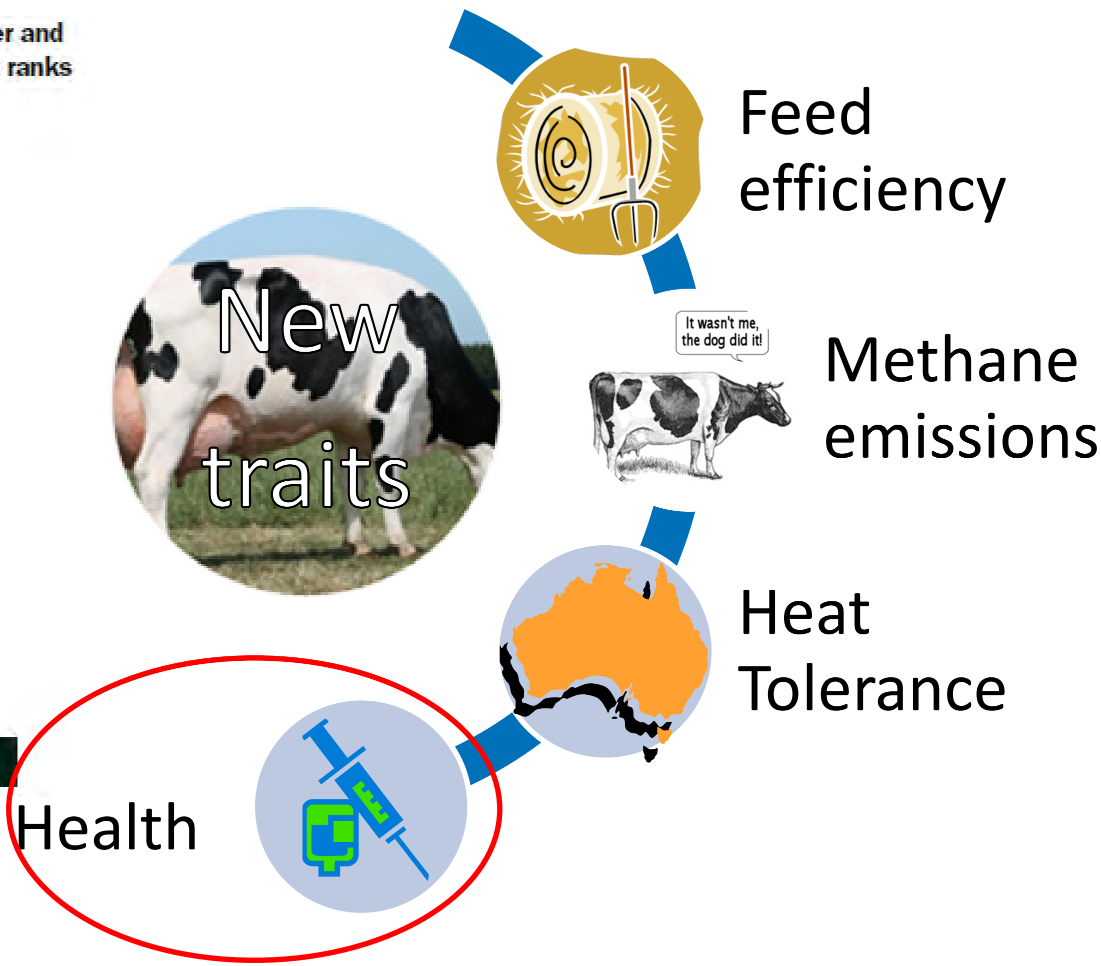
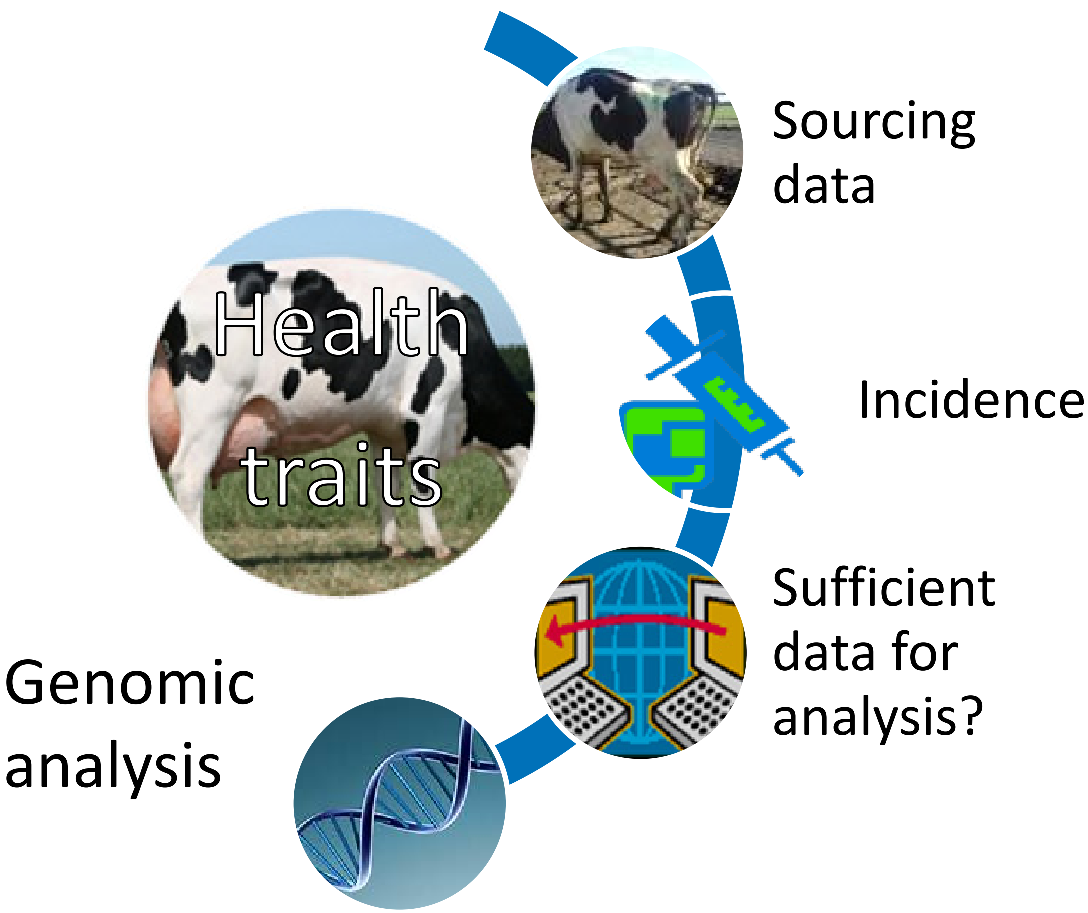
New Traits

Figure 1: The order of breeding trait preferences over and above their purely economic value and average trait ranks





Health Data for Healthy Cows: New traits



- Collect health information from farms and veterinary practices
- Estimate the incidence of health disorders
- Calculate provisional genetic parameters
- Estimate the accuracy of genomic selection achievable for health traits

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Ginfo (+): Improved accuracy and new traits

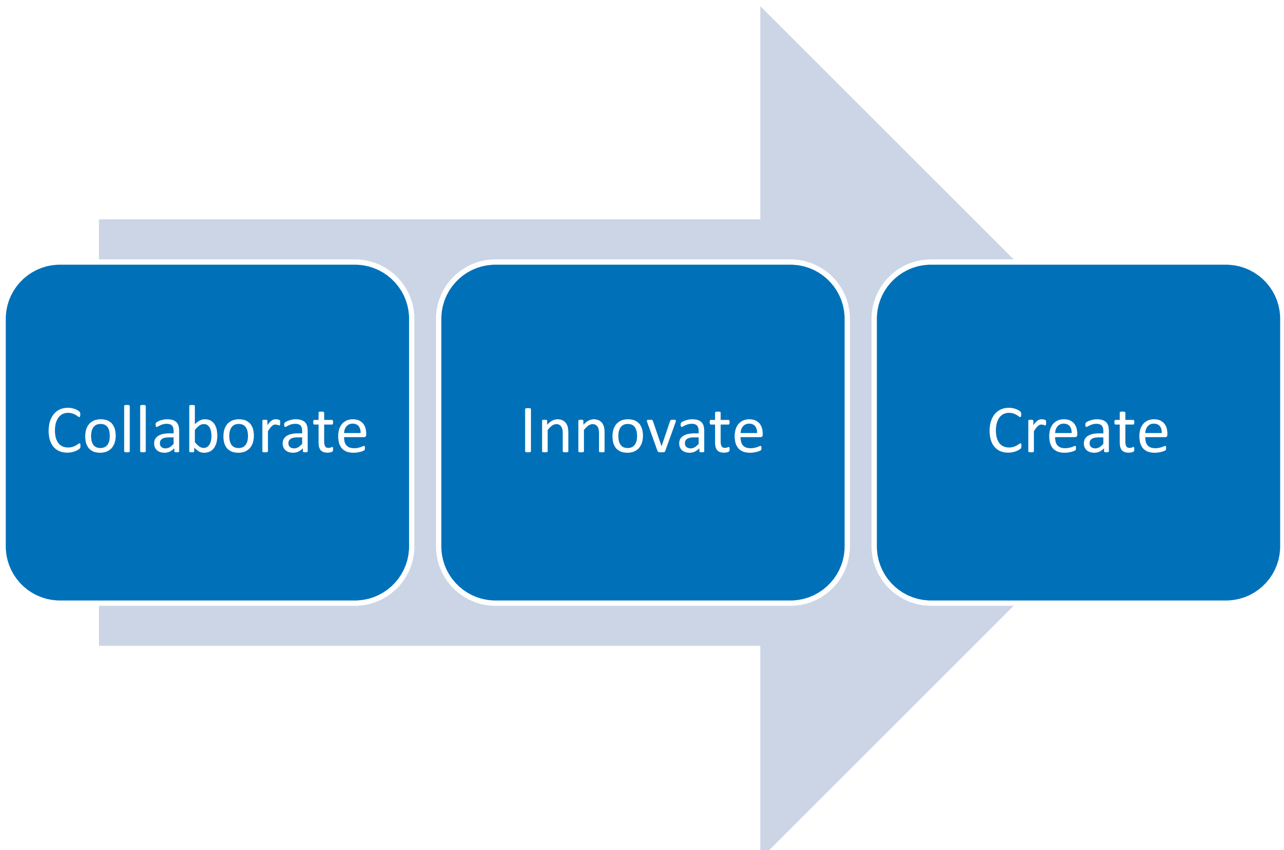
Dairy Futures CRC

Department of Environment and Primary Industries

State Government Victoria

Australian Dairy Herd Improvement Scheme

Holstein Australia


Collaborate
Innovate
Create

Thank you