

# Impact of the National Cooperator Database on Dairy Cattle Genetic Progress

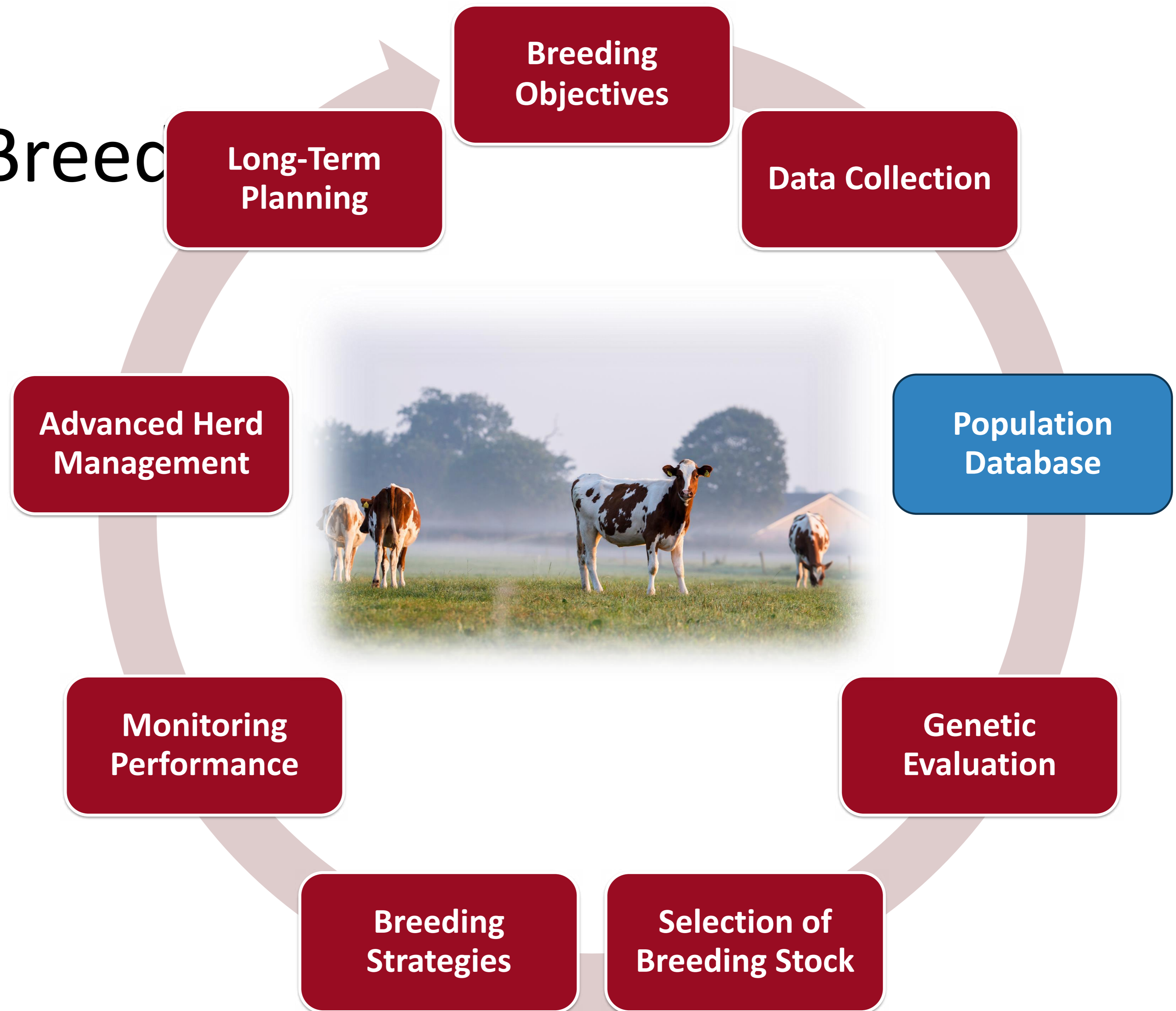
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**João Dürr, CDCB CEO**

CDCB Industry Meeting  
Madison, WI, Oct 4, 2023

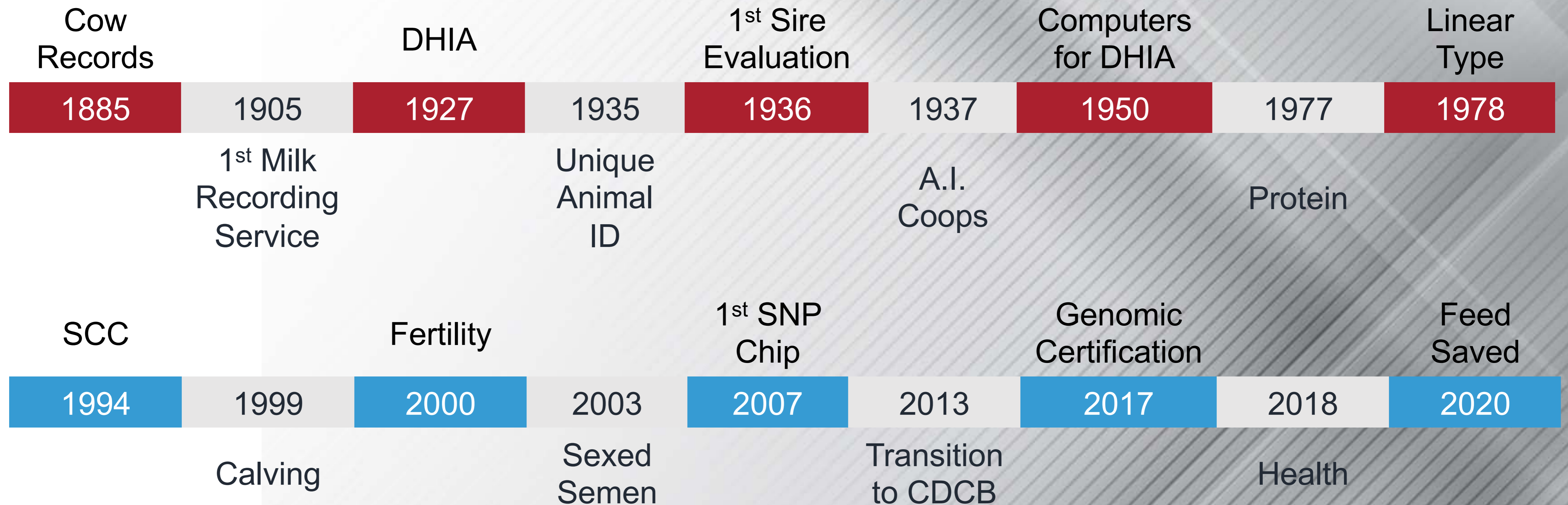


# Dairy Cattle Breeding





# A bit of history





# Collaborative Arrangement: CDCB



Photo from Amelcor

Dairy Records  
Providers



Dairy Records  
Processing Centers



National  
Association of  
Animal Breeders

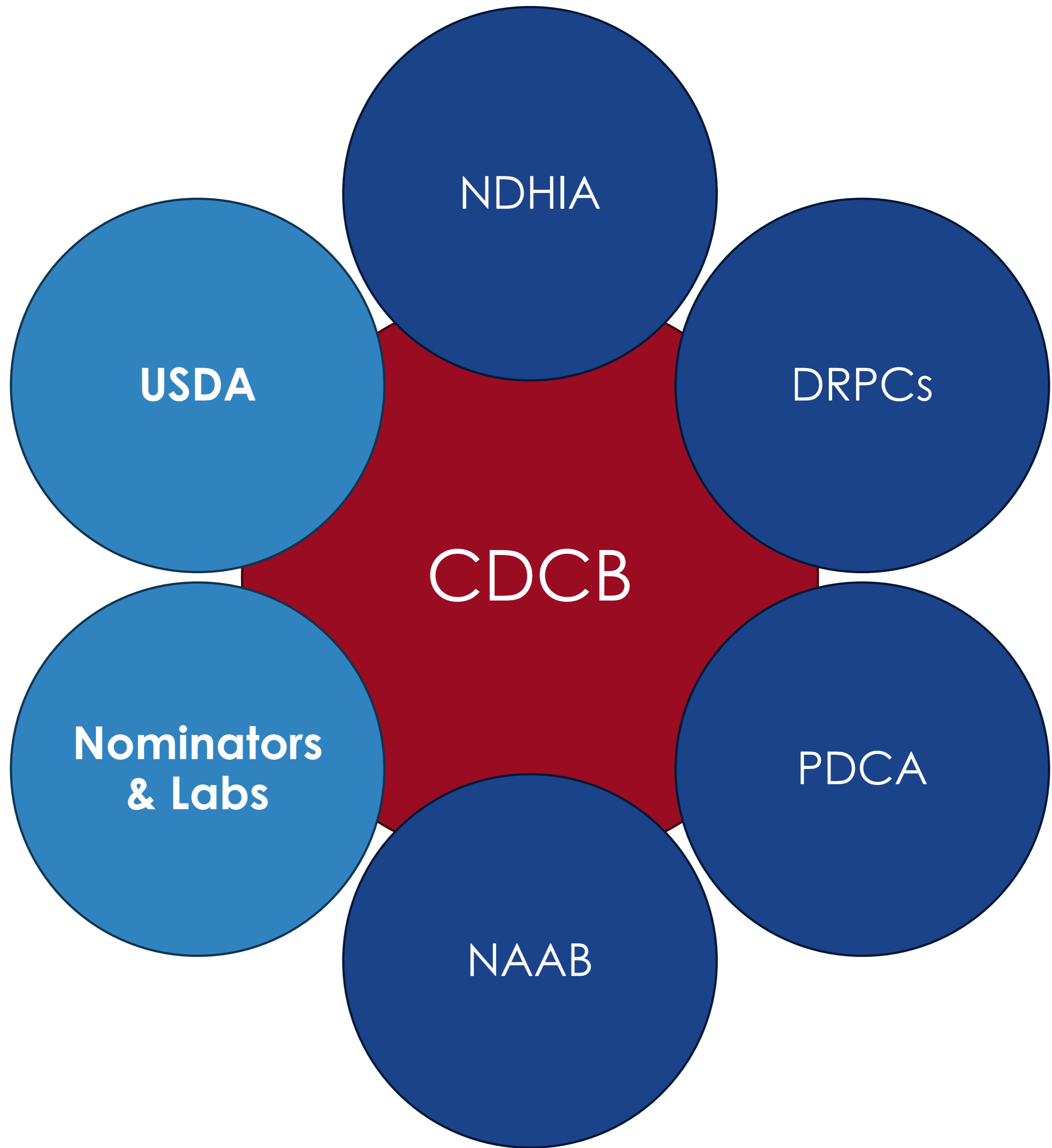


Photo from Holstein Association USA

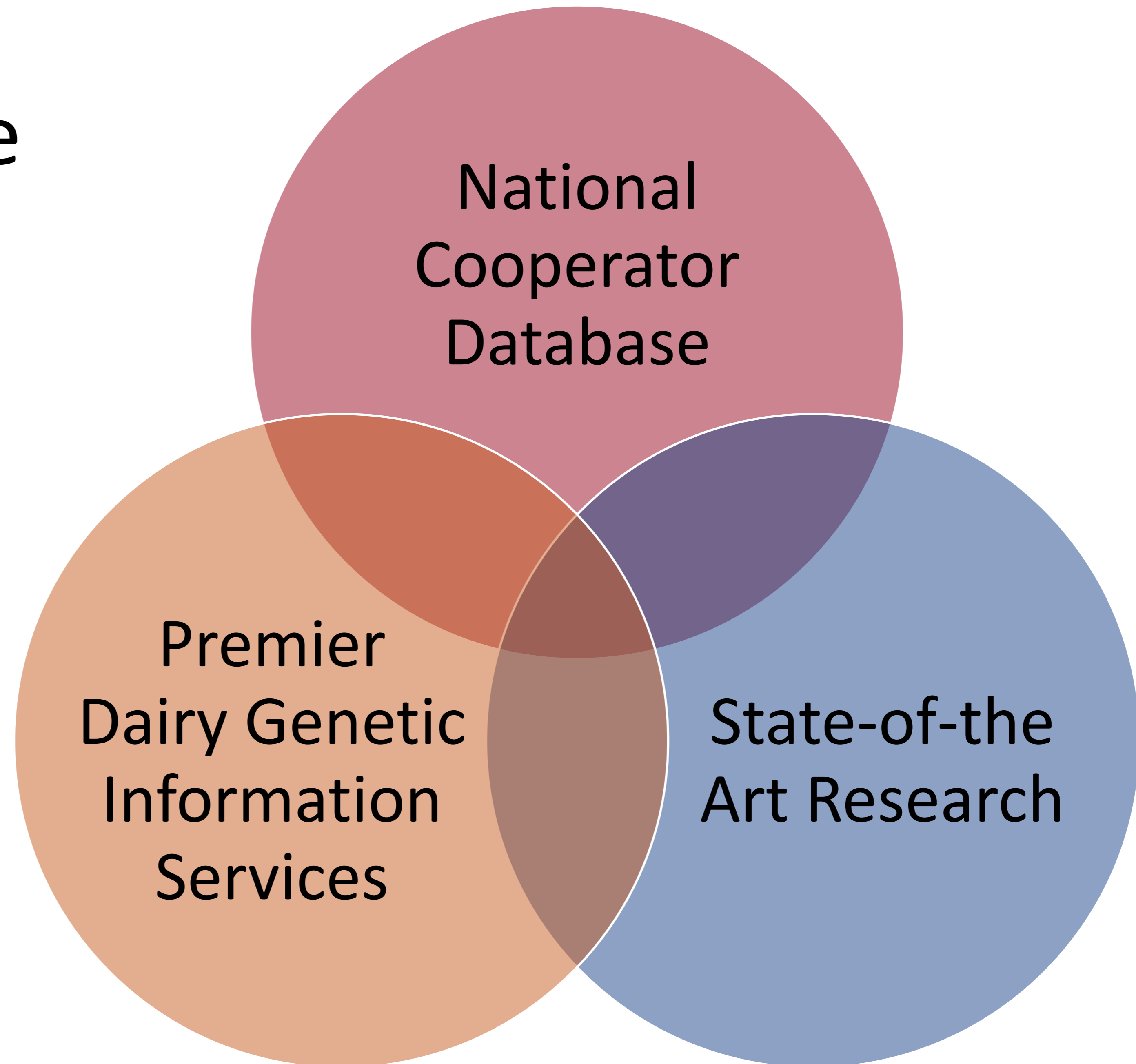
Purebred Dairy  
Cattle Association



# Full collaborative Arrangement



# CDCB Purpose







"Pre-competitive collaboration enables the private sector to effectively address systemic challenges by coordinating sustainability efforts, incorporating diverse perspectives, resources, and expertise, and scaling impactful solutions." *(Kennedy, Girard & Olson, 2022)*



# Successful collaboration

Culture  
Respect  
Adaptability  
Shared resources  
Evaluation & Feedback  
ROLES & RESPONSIBILITIES  
**Open communication**  
Trust  
Mutual benefit  
Governance

VALUES  
LEADERSHIP  
COMMITMENT  
ENGAGEMENT

Confidentiality

Conflict resolution  
Clear goals  
Clear agreements

Shared risks



# THE NATIONAL COOPERATOR DATABASE



# National Cooperator Database Purpose

Sustain state-of-the-art research and develop data-driven processes that empower dairy producers to effectively and sustainably manage their businesses by providing valuable insights and tools for informed decision-making.





# Essential Features of a National Database

## Representativeness

- Includes a diverse and representative sample of the entire population.

## Data Quality and Security

- High-quality, accurate data with robust security.

## Comprehensive Data

- Cover a wide range of demographic and populational aspects, including longitudinal data.

## Data Accessibility

- User-friendly interface and support data access for researchers, policymakers, and other stakeholders.

## Ethical and Legal Compliance

- Ethical standards, privacy regulations, and legal requirements governing data collection and usage.

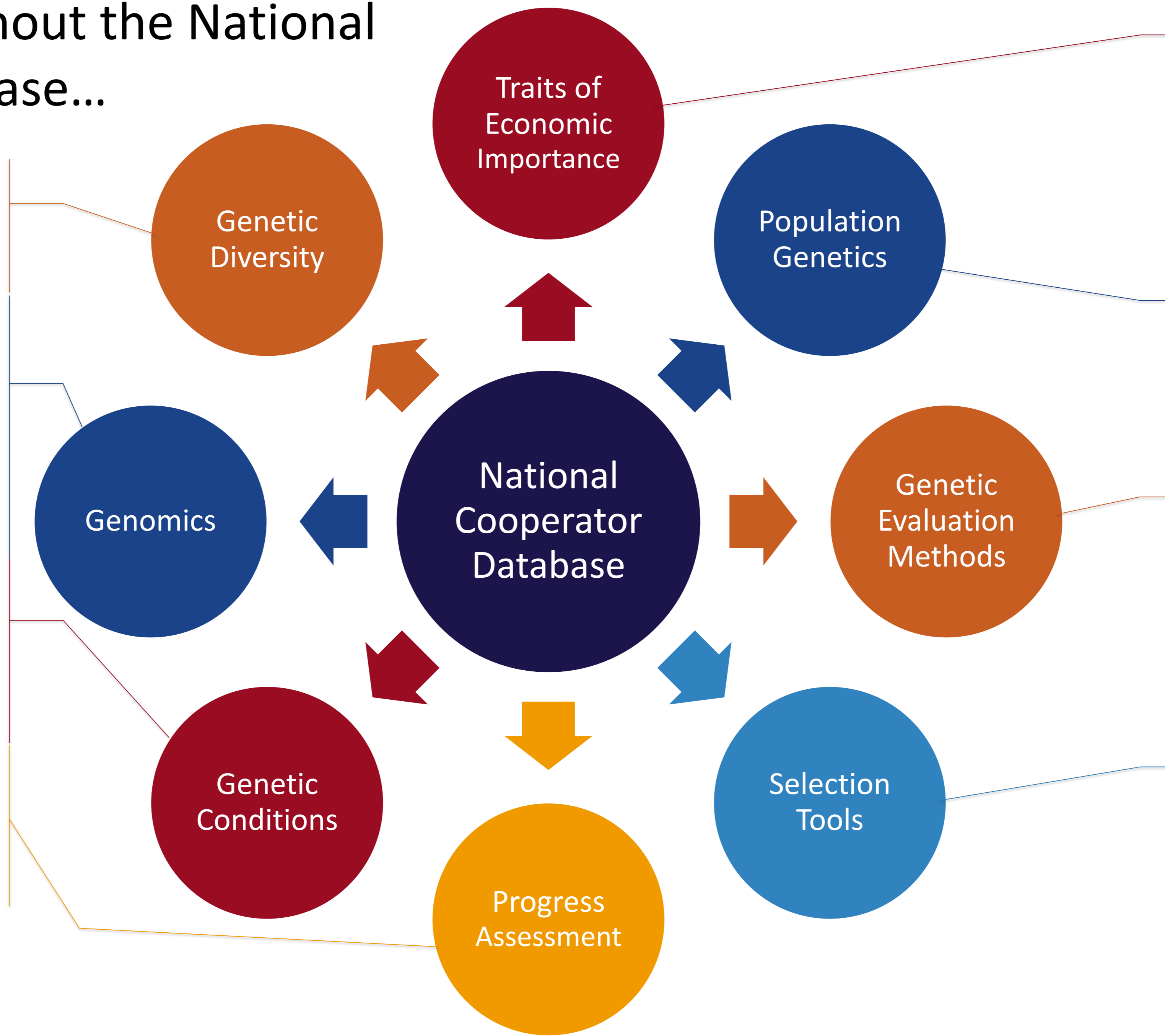
## Data Collaboration

- Encourage collaboration, data sharing, and cross-disciplinary research to maximize the utility of the database.



# Imagine dairy without the National Cooperator Database...

- Inbreeding  
Heterosis  
Effective Population Size
- Bovine Genome  
SNP Chips  
Selection Early in Life  
Parentage Discovery  
Genetic Tests
- Deleterious Mutations  
Mendelian Traits  
Haplotype Tests  
Chromosomal Abnormalities
- Phenotypic Trends  
Genetic Trends  
Benchmarks



- Lactation Curve  
Fat & Protein  
SCC  
Calving Ease  
Fertility  
Longevity  
Health ...
- Variability  
Heritability  
Genetic Correlations  
Reliabilities
- Contemporary Comp.  
BLUP  
Relationship Matrix  
Sire/Animal Models  
Progeny Testing  
GBLUP  
Single-Step
- Genetic Merit  
Selection Indexes  
Mating Systems  
Culling  
Crossbreeding



# National Cooperator Database Numbers (August 2023)

DATA TYPE	COUNT
Animals	96 M
Genotypes	8 M
Lactations	105 M
Type	3 M
Fertility	96 M
SCC	69 M
Calving	39 M
Health	11 M
Feed Intake	10 K



# Focus on Purpose

## Genetic Evaluations

- Weekly
- Monthly
- Triannual
- Interim
- Quick turnaround

## Traits

- Production (5)
- Feed Efficiency (2)
- Longevity (4)
- Health (7)
- Fertility (4)
- Calving (5)
- Conformation (22)
- **Total Merit Indices (4)**

## Breeds

- Ayrshire
- Brown Swiss
- Guernsey
- Holstein
- Jersey
- Milking Shorthorn
- (Crossbreds)

## Other

- Parentage
- Breed %
- Genomic inbreeding
- Haplotypes & Genetic Conditions
- WebConnect
  - Stats
  - Results
- Outreach



# Leading the way

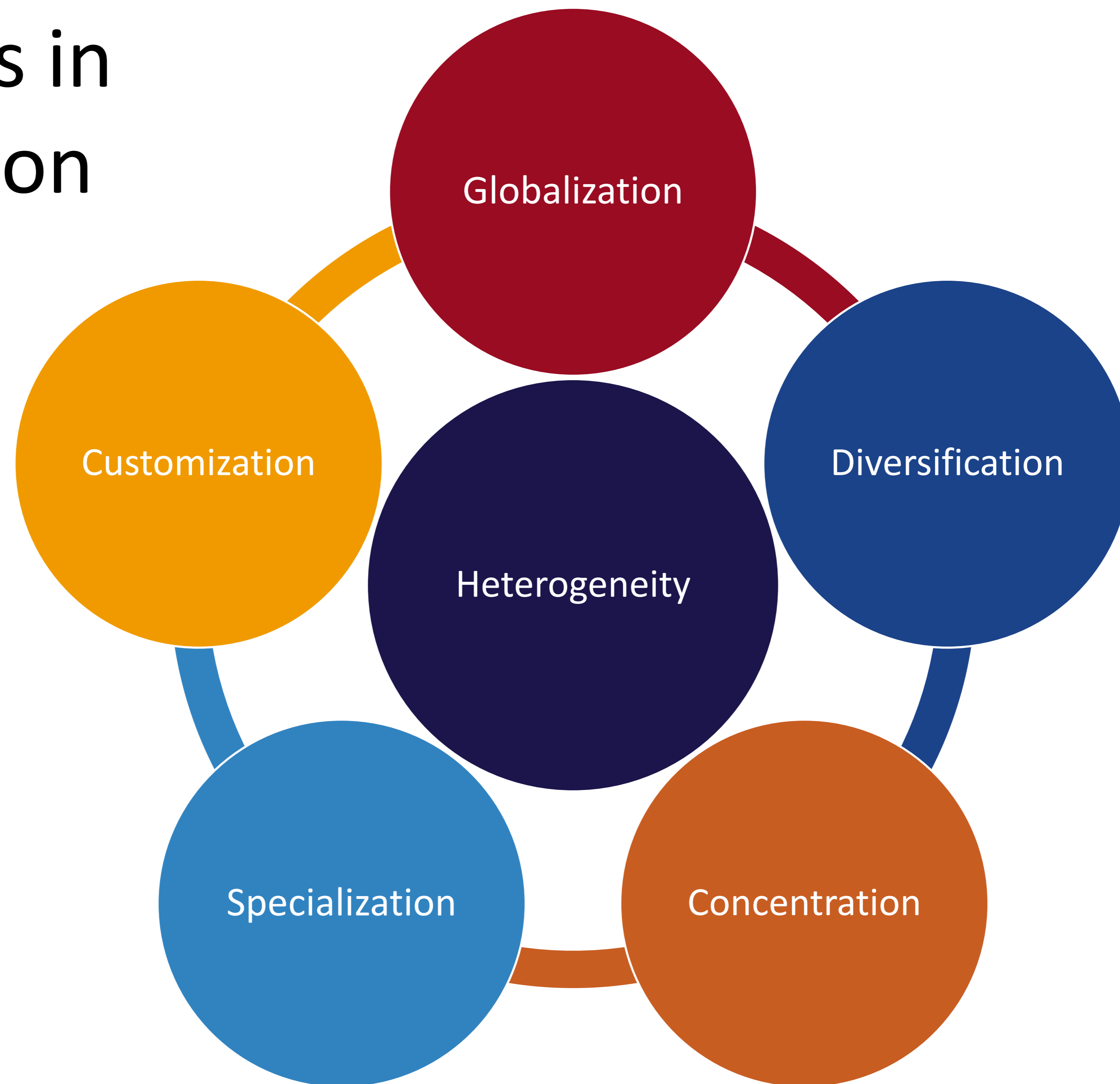
- 19 Genomic Nominators & 9 Genotyping Labs Certified
- Over 1.2 million animals genotyped in 2022
- Genomic relationships between genotyped cows and marketed bulls available
- 98% of sires & 57% of dams of genotyped animals born in 2022 were validated
- 78,964 SNPs used in evaluation
- 53 chips validated and supported
- 1,560 cases of chromosomal abnormalities discovered so far
- Only evaluation system using constructed dams to incorporate discovered ancestors
- Genomic evaluation of crossbred animals
- Feed saved genomic evaluations



# CHALLENGES AND FUTURE DIRECTIONS



# Data streams in transformation



# Modern dairy quest for efficiency

**Automated  
Milking  
Systems**

**Precision  
Feeding**

**Health  
Monitoring**

**Data  
Analytics**

**Cow Comfort  
and Welfare**

**Genomic  
Selection**

**Manure  
Management**

**Milking  
Parlor  
Upgrades**

**Remote  
Monitoring**

**Nutrient  
Management**

**Efficient  
Resource Use**

**Traceability  
and Quality  
Control**

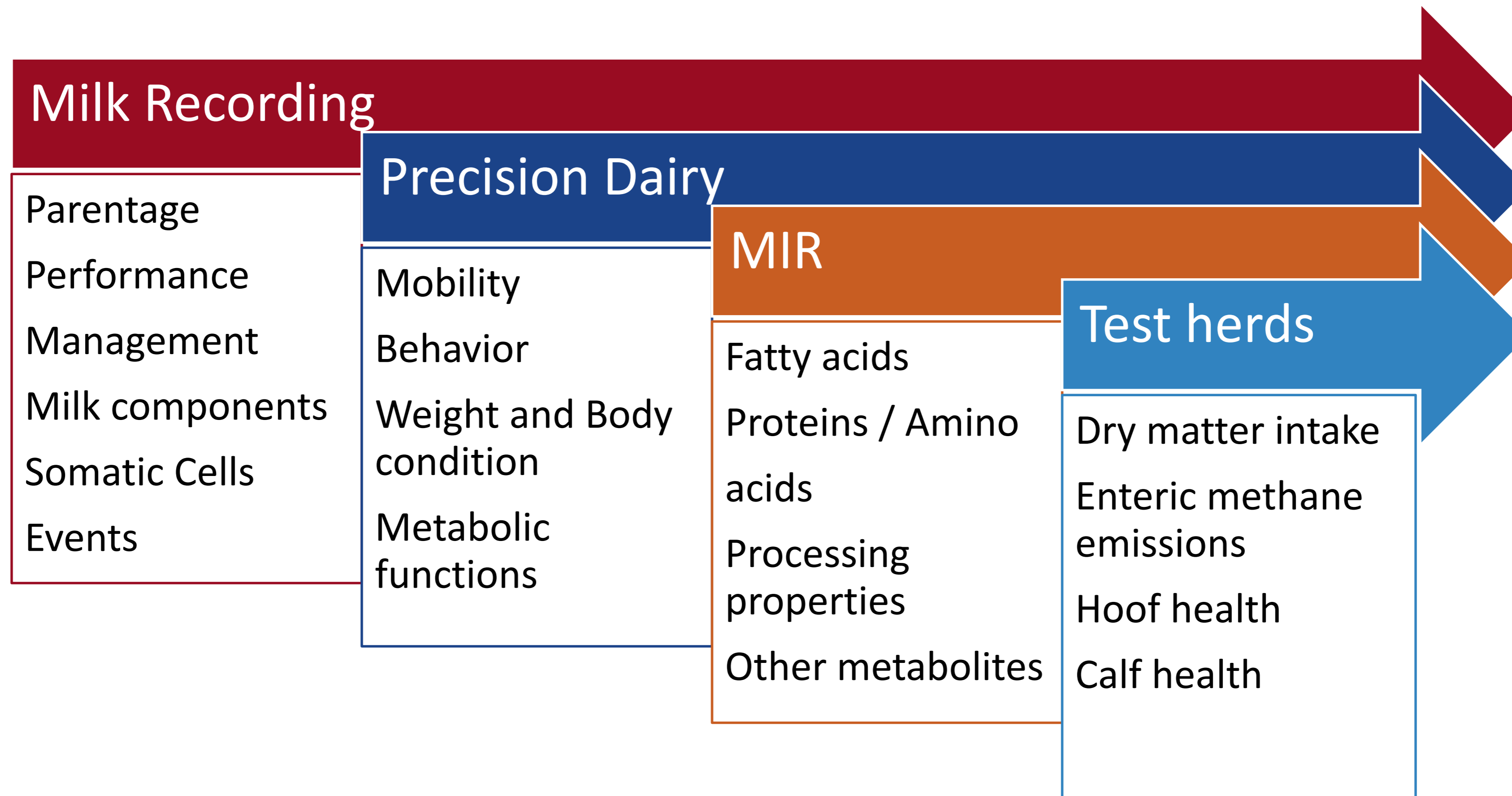
**Labor Savings**

**Sustainable  
Practices**

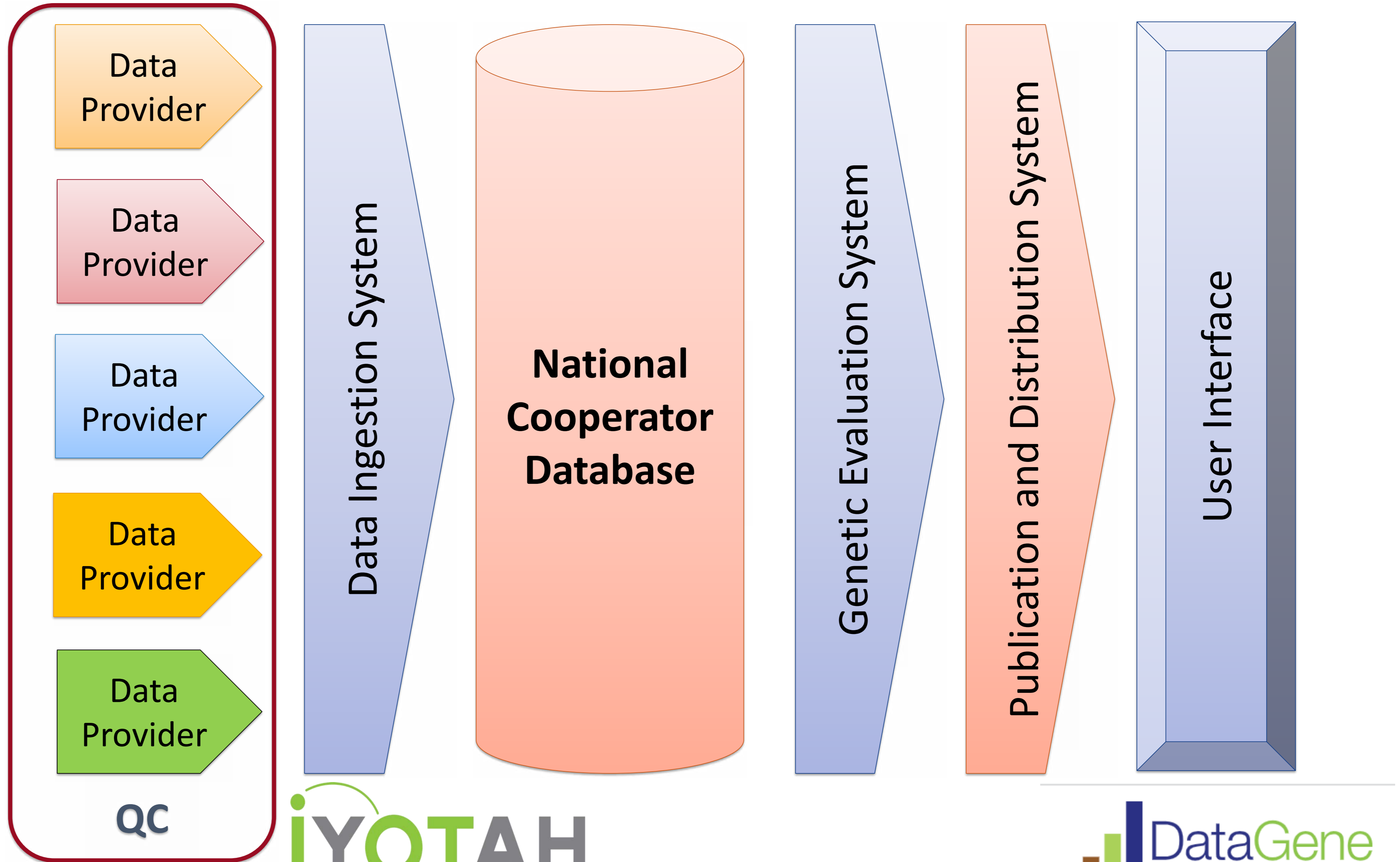
**Knowledge  
Sharing**



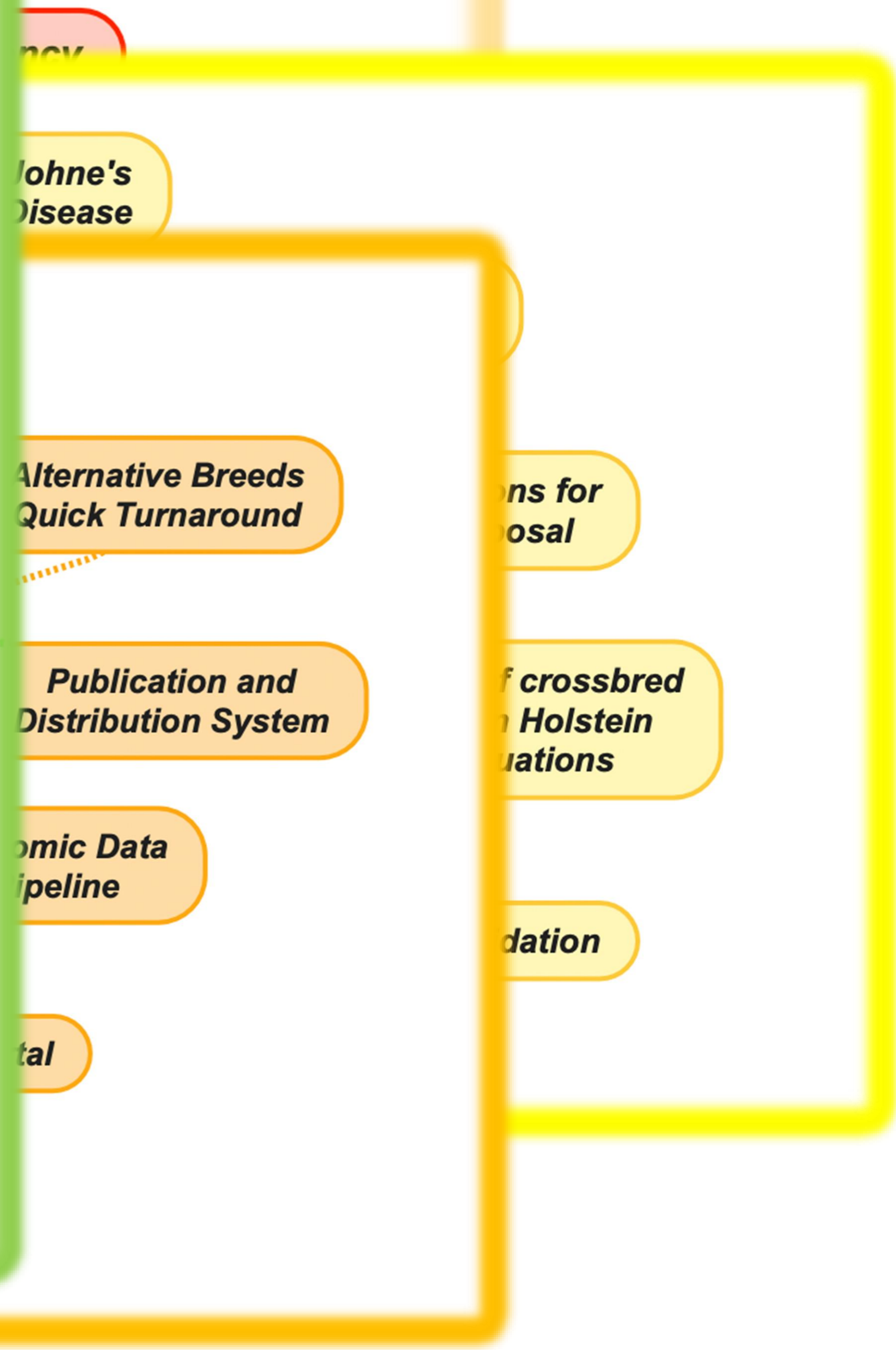
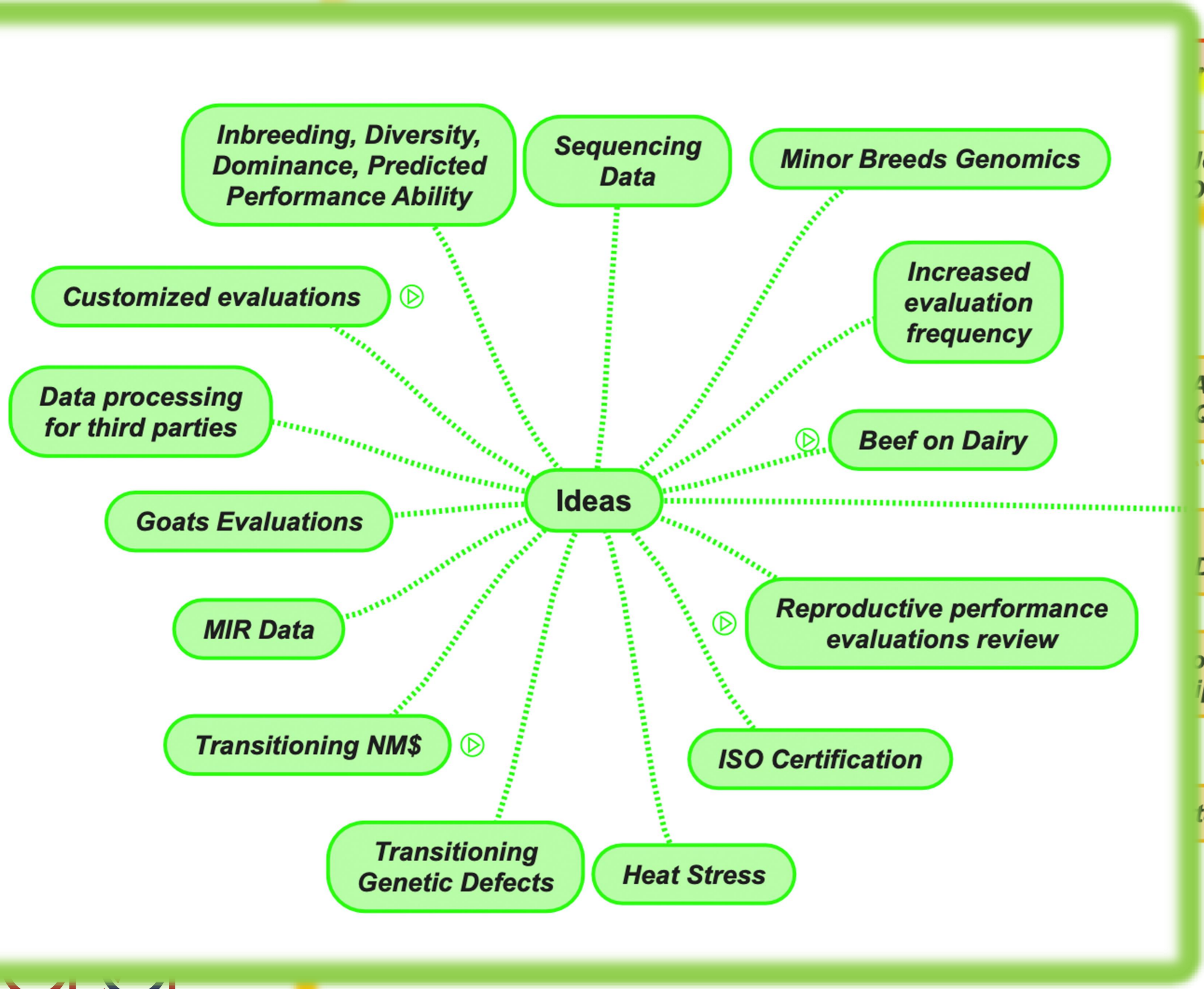
# Embrace Changes: Dairy Phenotypes



# Embrace Changes: Infrastructure







# Data Providers Workshop: Priority Areas





# Getting ready

By expanding our capacity, fostering innovation, strengthening partnerships, diversifying our portfolio, securing data streams, quickly adapting to changes, improving communication, and developing talents, CDCB is positioned to lead the way and provide the dairy genetic tools required for future success.



# Celebrating a Decade of Pre-Competitive Collaboration

*João Dürr & Ole Meland  
2023 CDCB Industry Meeting*

**THANKYOU!**

