Genomic Revolution: The Next 10 Years

João Dürr, CDCB CEO

February 25, 2019 – Reno, NV

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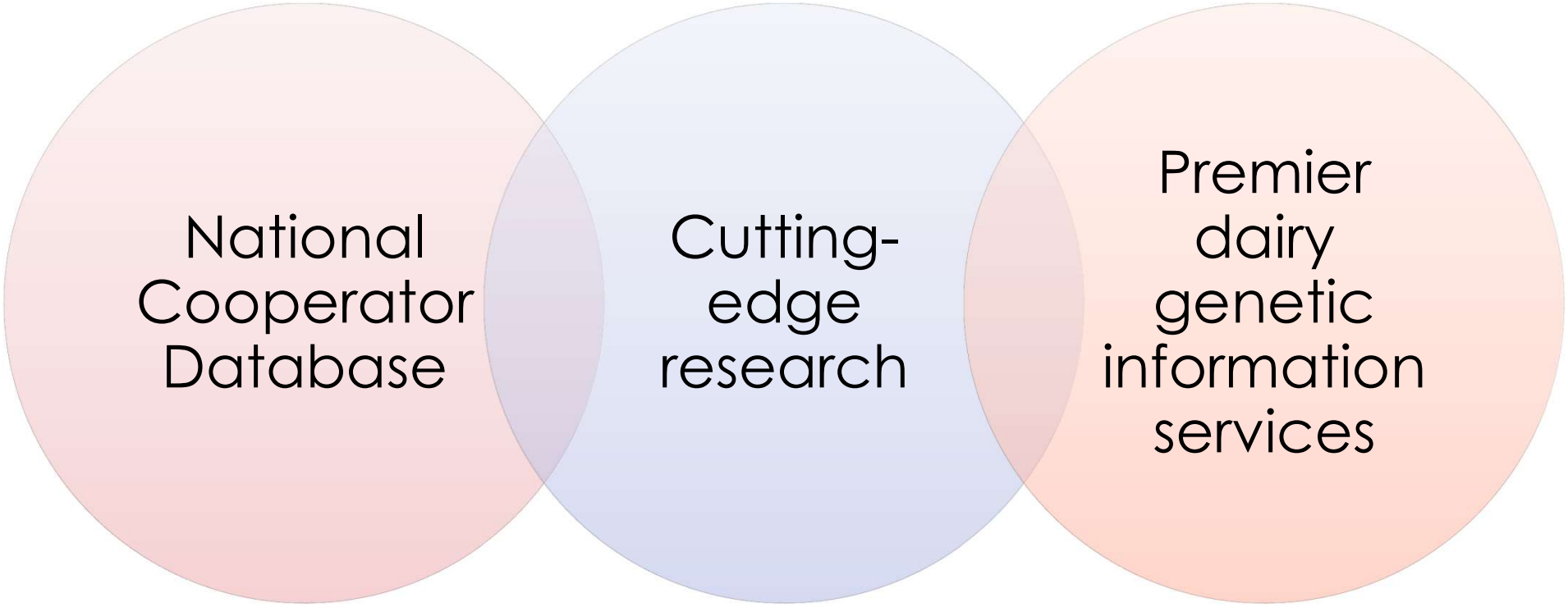
Value-added to dairy producers



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CDCB is a non-profit dairy driven company that provides pre-competitive services and products in an independent and transparent framework to improve the genetics and management of dairy herds worldwide.

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THE GENOMIC REVOLUTION

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

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

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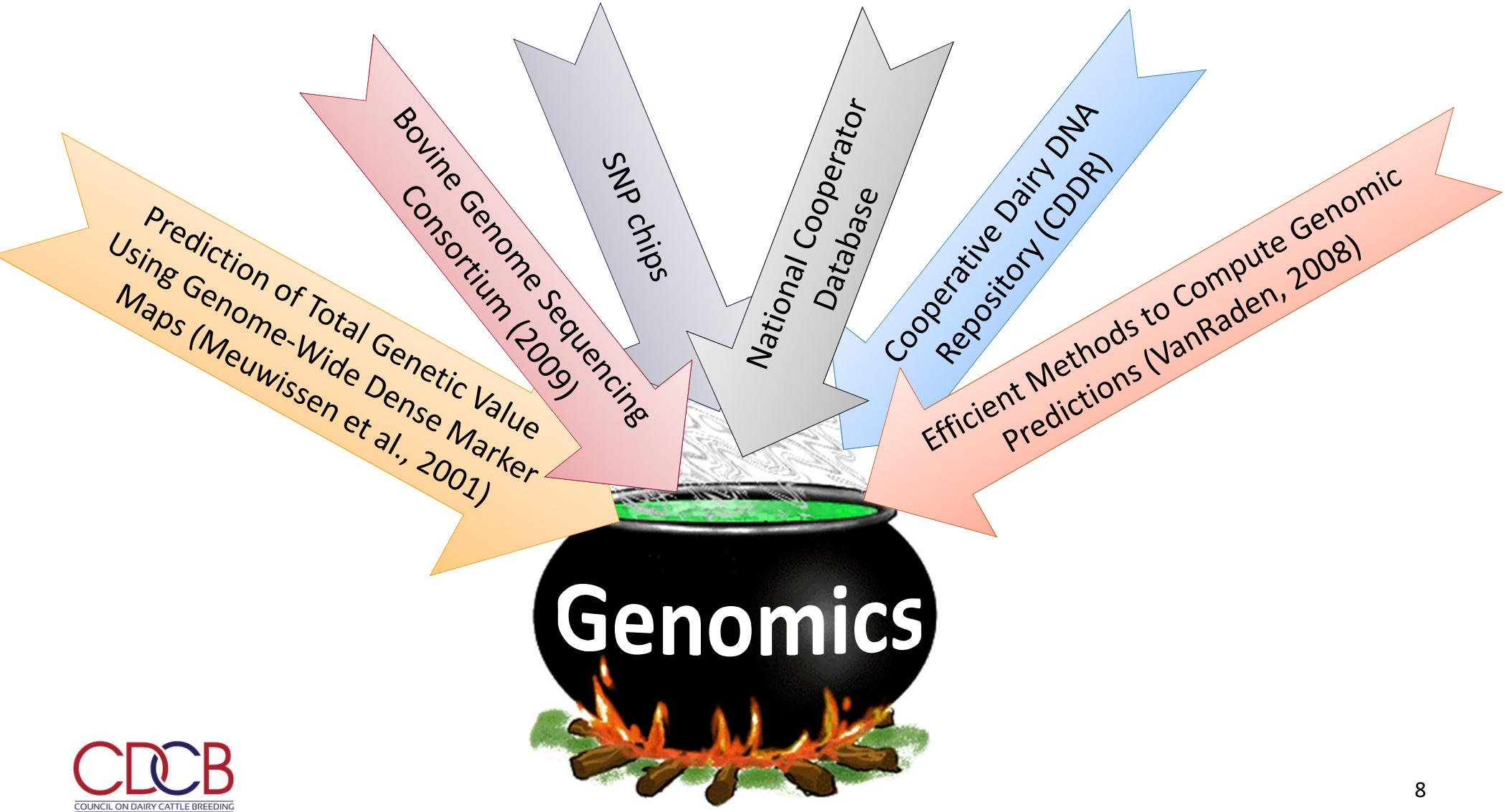

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2019: Ten years of genomic evaluations in U.S.

ANIMAL IMPROVEMENT PROGRAM

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Changes to evaluation system (January 2009)

Genomic evaluations become official

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

*Animal Improvement Programs Laboratory, †Bovine Functional Genomics Laboratory

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Consequences of genomic selection

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

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Consequences of genomic selection

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

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Consequences of genomic selection

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

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THE NEXT REVOLUTION

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Dairy cattle traits evaluated by USDA & CDCB

Year	Trait
1926	Milk & fat yields
1977	Protein yield (& solids-not-fat)
1978	Conformation (type)
1994	Productive life, somatic cell score (mastitis resistance)
2000	Calving ease (Iowa State University, 1978–99)
2003	Daughter pregnancy rate
2006	Stillbirth rate, bull conception rate (ERCR, DRMS, Raleigh, NC, 1986–2005), milking speed
2009	Cow and heifer conception rates, genomic evaluation
2012	Mobility, calving-to-insemination interval
2016	Gestation length
2017	Cow livability
2018	Health traits (milk fever, displaced abomasum, ketosis, mastitis, metritis, retained placenta)
2019	Early first calving, genomic evaluation for crossbreds, feed efficiency

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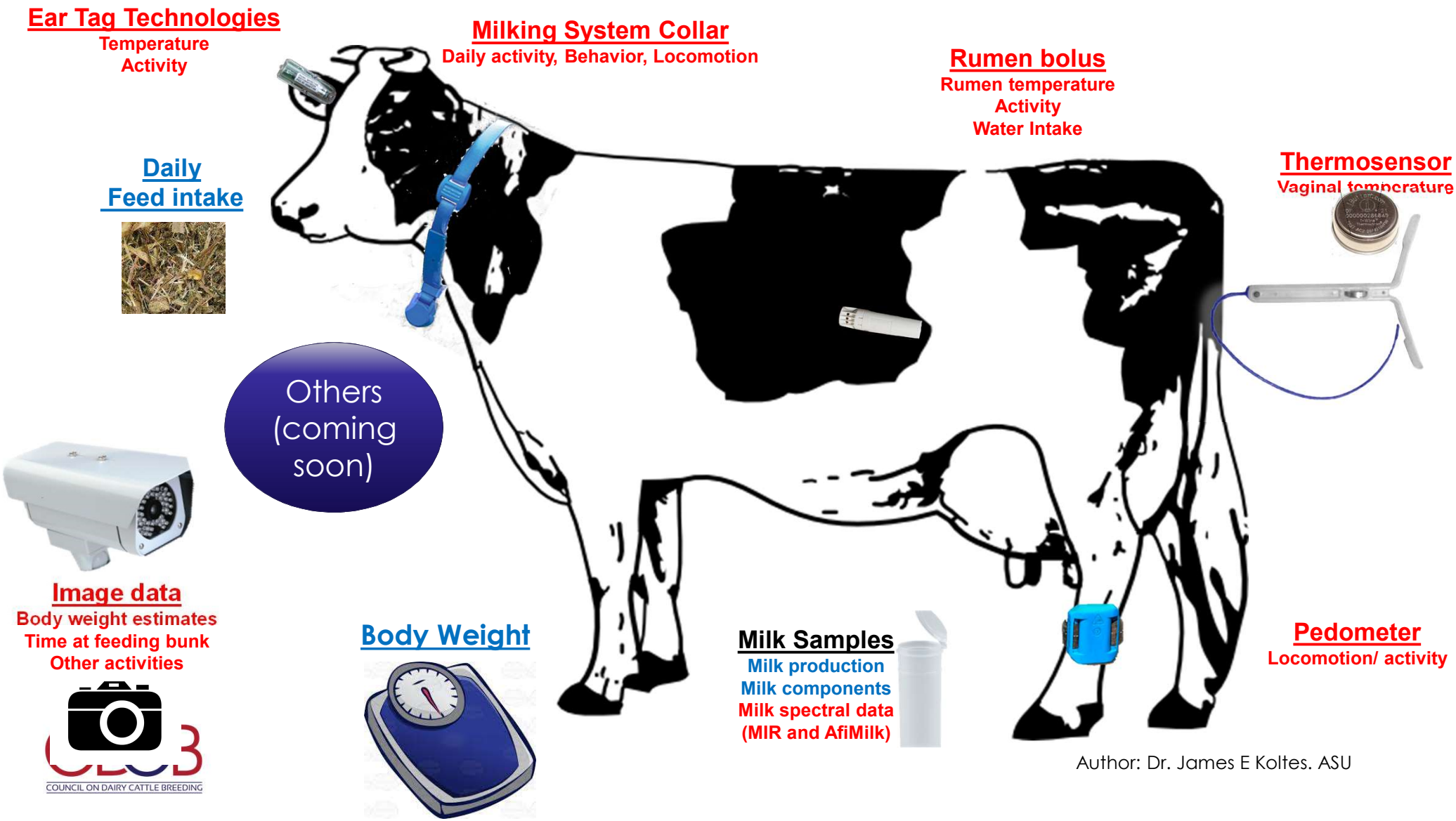

Author: Dr. James E Koltes. ASU


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