



Ten Years of DCRC: Where We've Been and Challenges for the Next 10 Years

Jeffrey S. Stevenson and William W. Thatcher



DDAIRY CATTLE REPRODUCTION COUNCIL

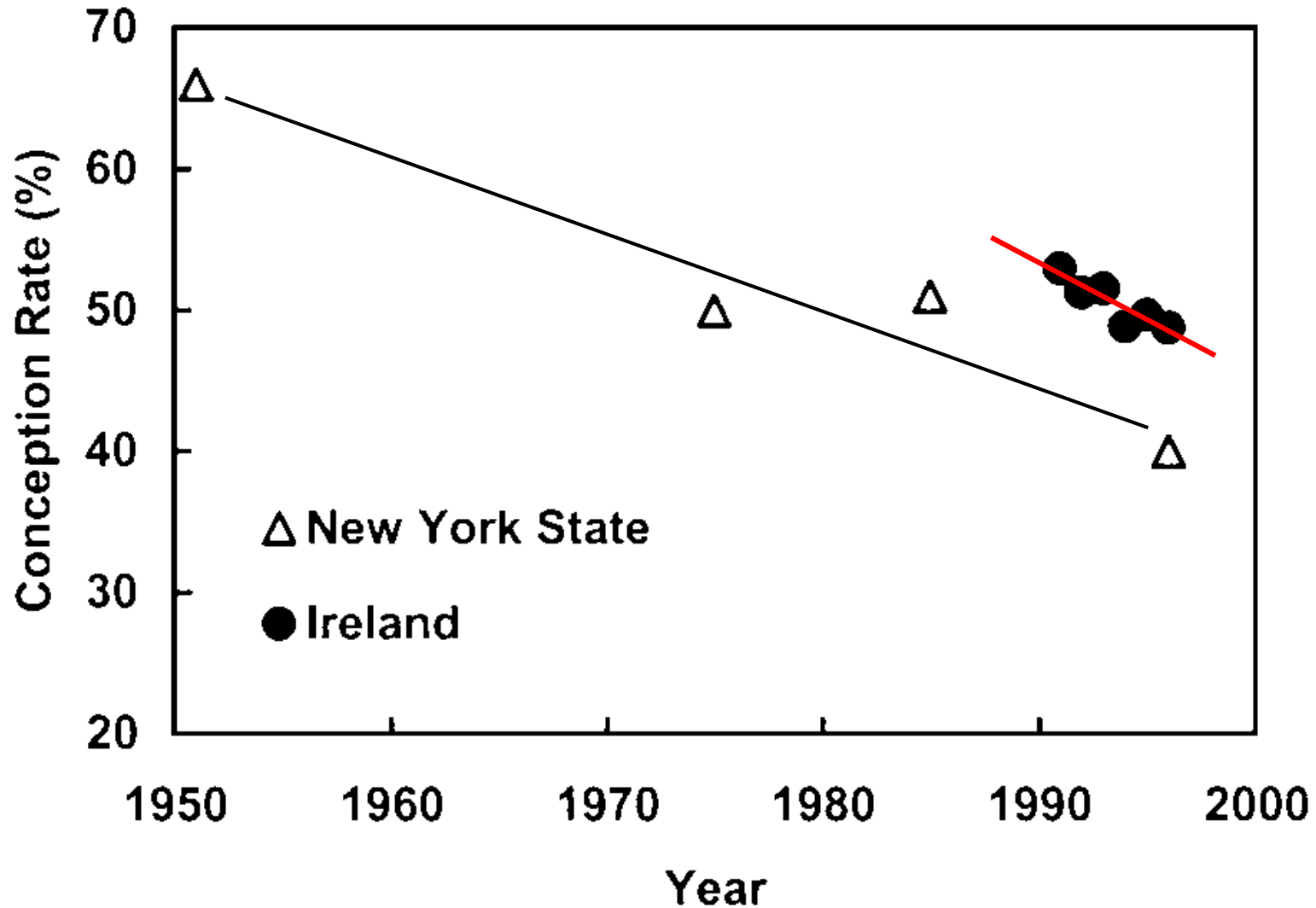
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The 21st century began with . . .

- Common belief that dairy cow fertility was on the decline.
- Reproductive performance of cows was **critical** to survival of individual dairy operations.
- Reasons for decline in fertility were neither completely understood nor elucidated.

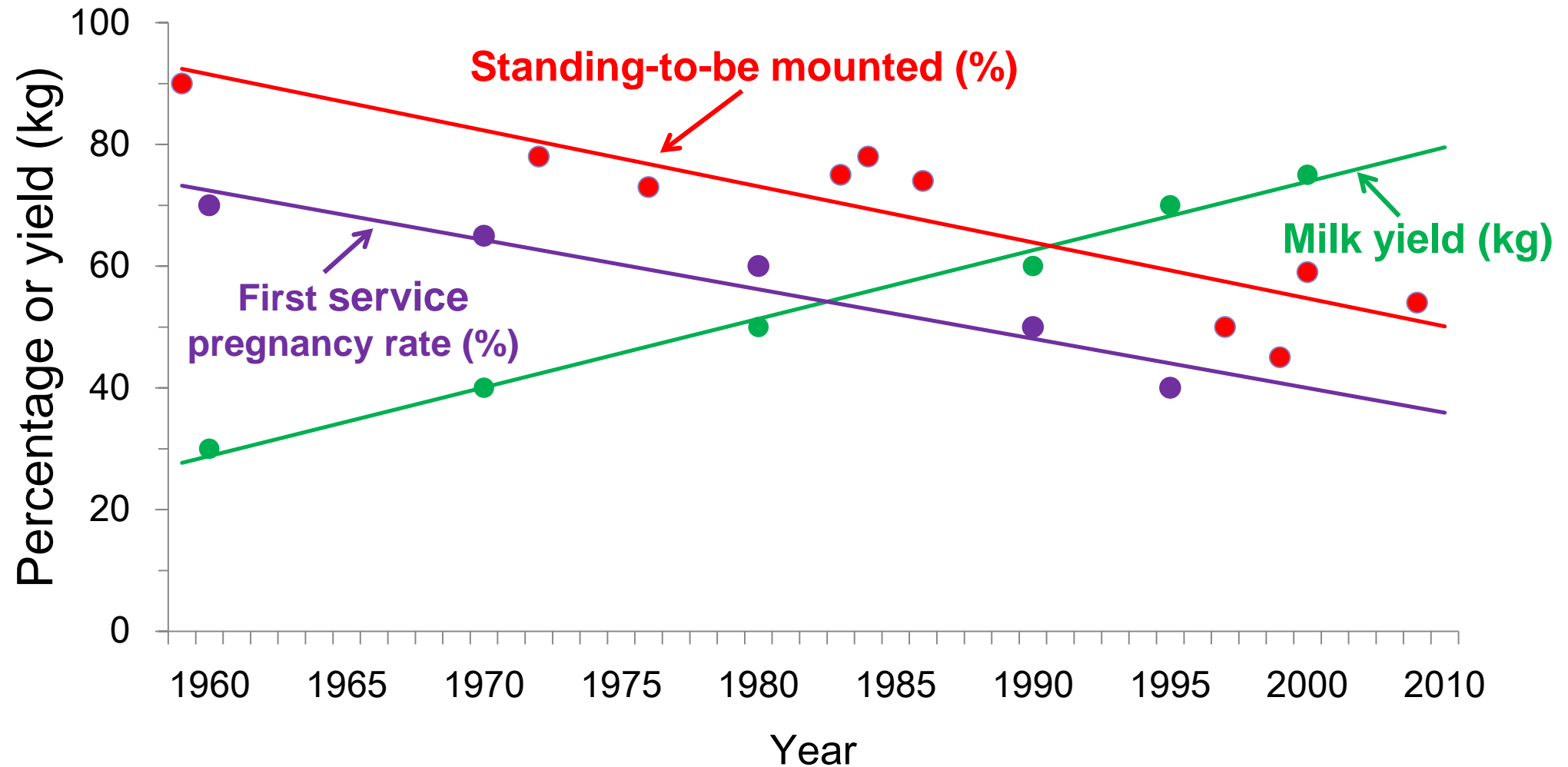


Fertility in **NY** and **Irish** dairy herds . . .

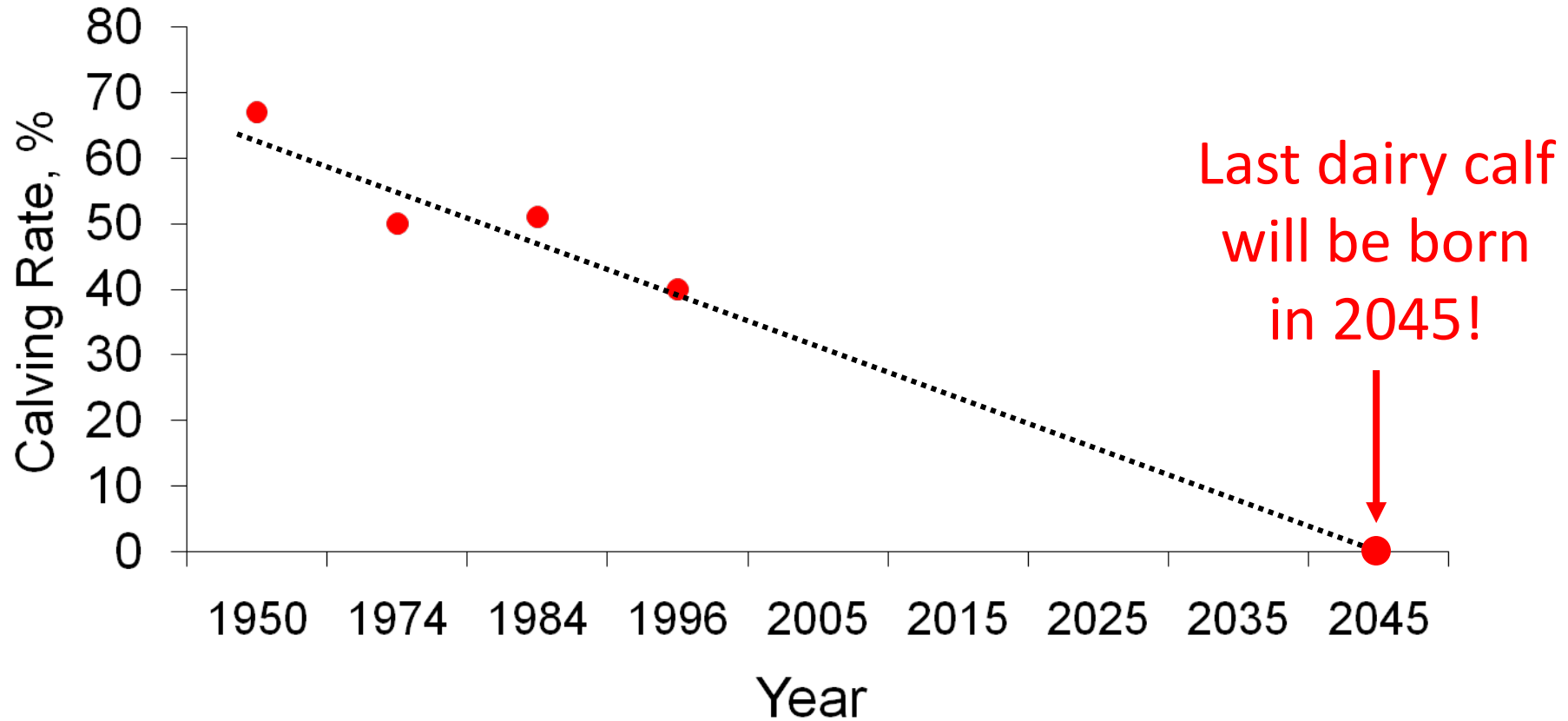


Lucy, 2001

Trends in dairy cows since 1960 . . .



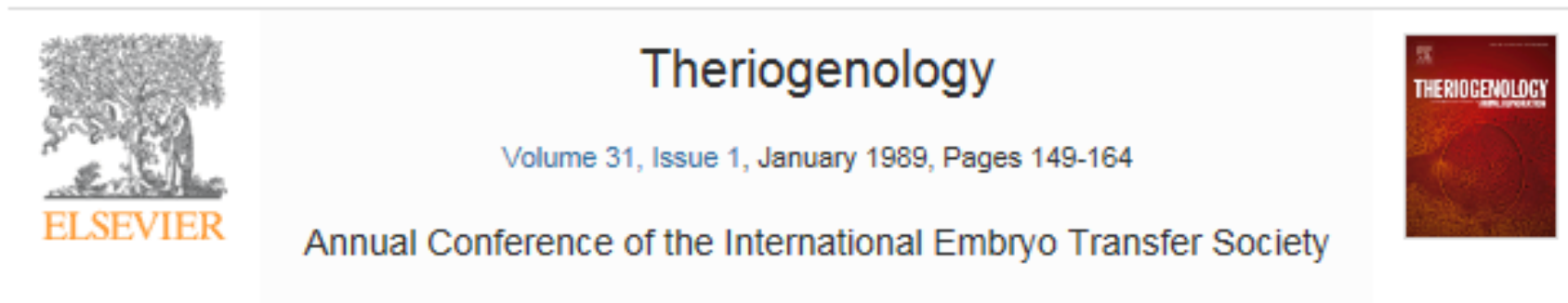
United Kingdom calving rate of dairy cows decreasing 1% per year . . .



Royal et al., 2000

Despite this negative trend . . .

- Research in reproductive physiology led to significant advances. For example:



Concepts for regulation of corpus luteum function by the conceptus and ovarian follicles to improve fertility

W.W. Thatcher ¹, K.L. Macmillan ², P.J. Hansen ¹, M. Drost ³



Despite this negative trend . . .

- Research in reproductive physiology led to significant advances during the 1990's.

Synchronization of Ovarian Follicular Waves with a Gonadotropin-Releasing Hormone Agonist to Increase the Precision of Estrus in Cattle: A Review¹

Herménégilde Twagiramungu*, Louis A. Guilbault^{*,†,2}, and Jacques J. Dufour*

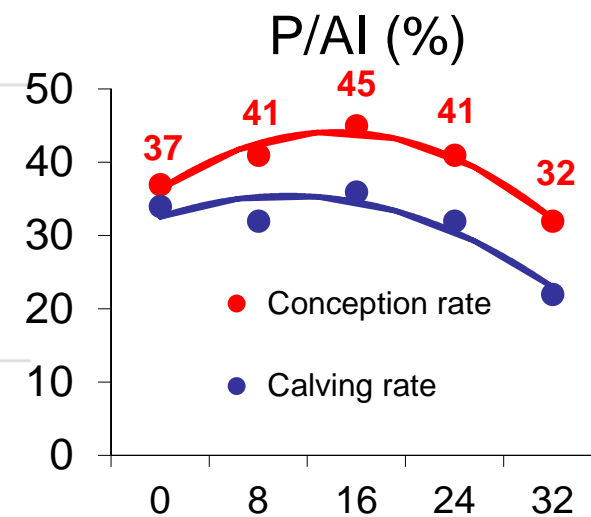
*Centre de Recherche en Biologie de la Reproduction, Département des Sciences Animales, Université Laval, Québec, Canada G1K 7P4 and [†]Agriculture and Agri-Food Canada Research Station, Lennoxville, Québec, Canada J1M 1Z3

J. Anim. Sci. 1995. 73:3141–3151



Despite this negative trend . . .

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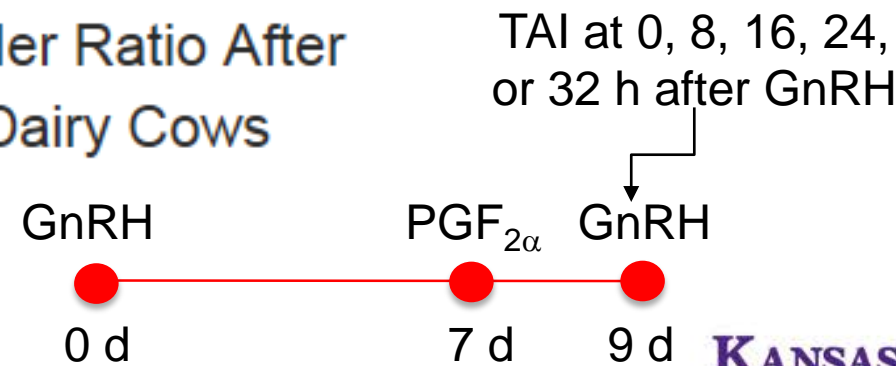
Article

Effect of Time of Artificial Insemination on Pregnancy Rates, Calving Rates, Pregnancy Loss, and Gender Ratio After Synchronization of Ovulation in Lactating Dairy Cows

J. Richard Pursley ¹, Roy W. Silcox [†], Milo C. Wiltbank ¹



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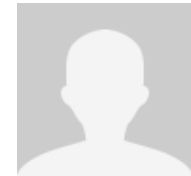
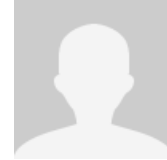
Missing link . . .

- Mechanism for communicating more effectively the novel new research-proven programs and technologies to:
 - Dairy veterinarians
 - Dairy producers
 - Dairy industry business and technical service reps



Key individuals . . .

- Dr. Austin Belschner, Pfizer Animal Health
- Dr. Bill Thatcher, University of Florida
- Dr. Jim Lauderdale, Lauderdale Enterprises
- Dr. Jose Santos, University of California-Davis
- Dr. Gary Heinrich, Pfizer Animal Health
- Dr. Fred Moreira, Pfizer Animal Health
- Dr. Ellen Jordan, Texas A&M University



Formal invitation . . .

- In 2005, a formal invitation was sent to a select group of individuals associated with the dairy industry.
- Objective: to convene a group representing various segments of the dairy industry to **create a national forum and organization devoted to improving fertility.**



Invitees to the 2005 “Forum” . . .

Invitees	Affiliation	Invitees	Affiliation	Invitees	Affiliation
Academia		Allied industry		Practicing veterinarians	
Jose Santos	UC-Davis	Fred Moreira	Pfizer Animal Health	John Lee	California
Bill Thatcher	Univ. Florida	Austin Belschner	Pfizer Animal Health	Lee Jones	Veterinarian
Ellen Jordan	Texas A&M	Chris Roeder	Pfizer Animal Health	Dairy producers	
Jeff Stevenson	Kansas State	Gary Heinrich	Pfizer Animal Health	Donald Niles	Casco, WI
Matt Lucy	Missouri	Barry Putnam	Genex	Jack DeJong	Visalia, CA
Mike Overton	UC-Davis	Dave Brister	Intervet Schering Plough	Mike Schouten	Hereford, TX
Milo Wiltbank	Wisconsin	Jim Lauderdale	Lauderdale Enterprises		
Paul Fricke	Wisconsin	Myron Brown	Merial		
Richard Pursley	Michigan State	Joe Dedrickson	Merial		
		Neil Michaels	ABS Global		
		Dave Prentice	ABS Global		
		Phil Modesitt	Church & Dwight		
		Ray Nebel	Select Sires		
		Ricardo Mattos	Monsanto Co.		
		Richard Markham	Phoenix Scientific		
		Daniel Luchini	NutriScience		



St. Louis Sheraton Westport Hotel
October 17-18, 2005



Preliminary vision . . .

Vision: To increase adoption of reproductive technologies by dairy producers to counteract the observed decrease in dairy cattle fertility.

Objective: Promote direct communication between those who develop technology and products (researchers, consultants, and commercial companies) and those who would benefit from such technology (dairy practitioners and producers).

Initial plan: Emulate a successful model organization such as the National Mastitis Council (NMC).



Forum agenda . . .

Current status of reproductive performance in dairy cows
(Bill Thatcher)



Preliminary vision for an applied reproduction group
(Jose Santos)



Group discussions to develop a vision statement and objectives of an organization

National Mastitis Council (NMC) history and critical success factors (Gary Heinrich)

Where do we go from here?

Summary and action list (Jim Lauderdale)



Forum results . . .

Named the organization: Dairy Cattle Reproduction Council

Drafted By-Laws (2005; later revised in 2014)

Elected Officers:

President: Jose Santos

Vice president: Ray Nebel

Secretary: Andy Skidmore

Treasurer: Austin Belschner

Organized the first meeting:

Nov. 2006 in Denver



Subsequent DCRC changes . . .

- In 2014, we amended the By-Laws to include verbiage about responsibilities of officers, board members, and perpetuating committees.
- Granted legal status as a public charity under Section 501(c)(3) by the IRS financed by a gift of \$5,000 from the American Dairy Science Association.



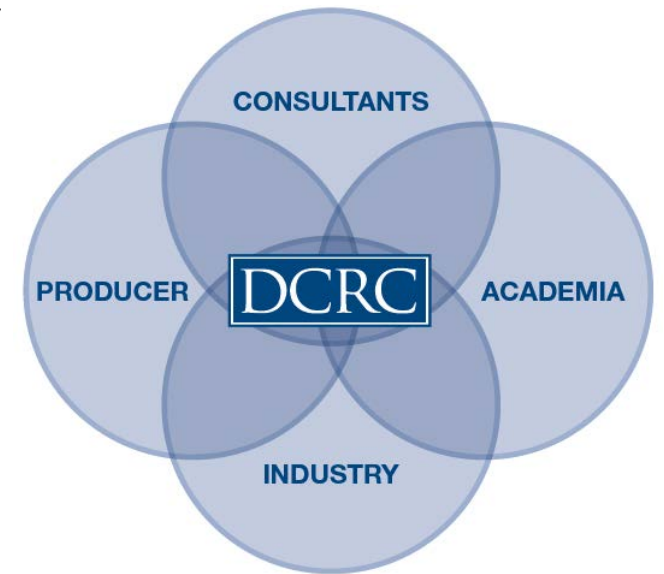
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Current legal status . . .

- The DCRC is organized exclusively for charitable, educational, and scientific purposes to:
 - Provide services to the dairy industry
 - Facilitate the dissemination of scientific and technical information.
- The DCRC can accept gifts and grants for financing the promotion of its educational role.



Reflections . . .

- First officers and board were unsung heroes.
- Charleston-Orwig (C|O)
 - Early management
- Bovine Veterinarian
 - Initial newsletters
- Federation of Animal Science Societies (FASS)
- Regional meetings held by sponsors contributed to attendance at DCRC.



Casey Hushon



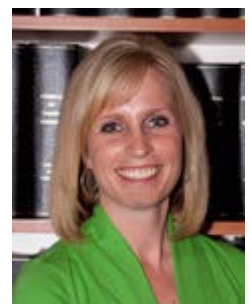
Marcy Tessmann



Mike Opperman



Cara Tharp



Jamie Ritter



Kudos . . .

- Andy Skidmore served as Secretary of DCRC during our first 8 years.
- Single-handedly managed the DCRC Reproduction Awards with the able assistance of Jim Ferguson, who analyzed the raw data submitted by the finalists.



J. Dairy Sci. 96:1269–1289
<http://dx.doi.org/10.3168/jds.2012-5805>
© American Dairy Science Association®, 2013.

Reproductive performance in a select sample of dairy herds



James D. Ferguson^{*1} and Andrew Skidmore†
^{*}University of Pennsylvania, School of Veterinary Medicine, Kennett Square 19348
[†]Merck Animal Health, Alexander, NY 14005

Kudos to our sponsors . . .

ABS Global	DFA	Micro
Accelerated Genetics	DHI-Provo	Monsanto
Afimilk	DSM Nutritional Products	MultiMin
AgriLabs	E.I. Medical imaging	Parnell
Animart	Elanco	Partners in Reproduction
Arm & Hammer Anim. Nutr.	Estroprotect	Pine Creek Nutrition Services
Arun P. Phatak	GEA	REPRO RESULTS
Balchem	Hoard's Dairyman	SCR Dairy
BCF Technology	IDEXX	Select Sires
Bayer	IntelliBond	Semex
BioTracking, LLC	Intervet/Schering-Plough	Valley Ag Software
Bovine Veterinarian	IVS Animal Health	Virtus Nutrition
Charleston Orwig	Merck Animal Health	Zinpro
DeLaval	Merial	Zoetis (Pfizer Animal Health)

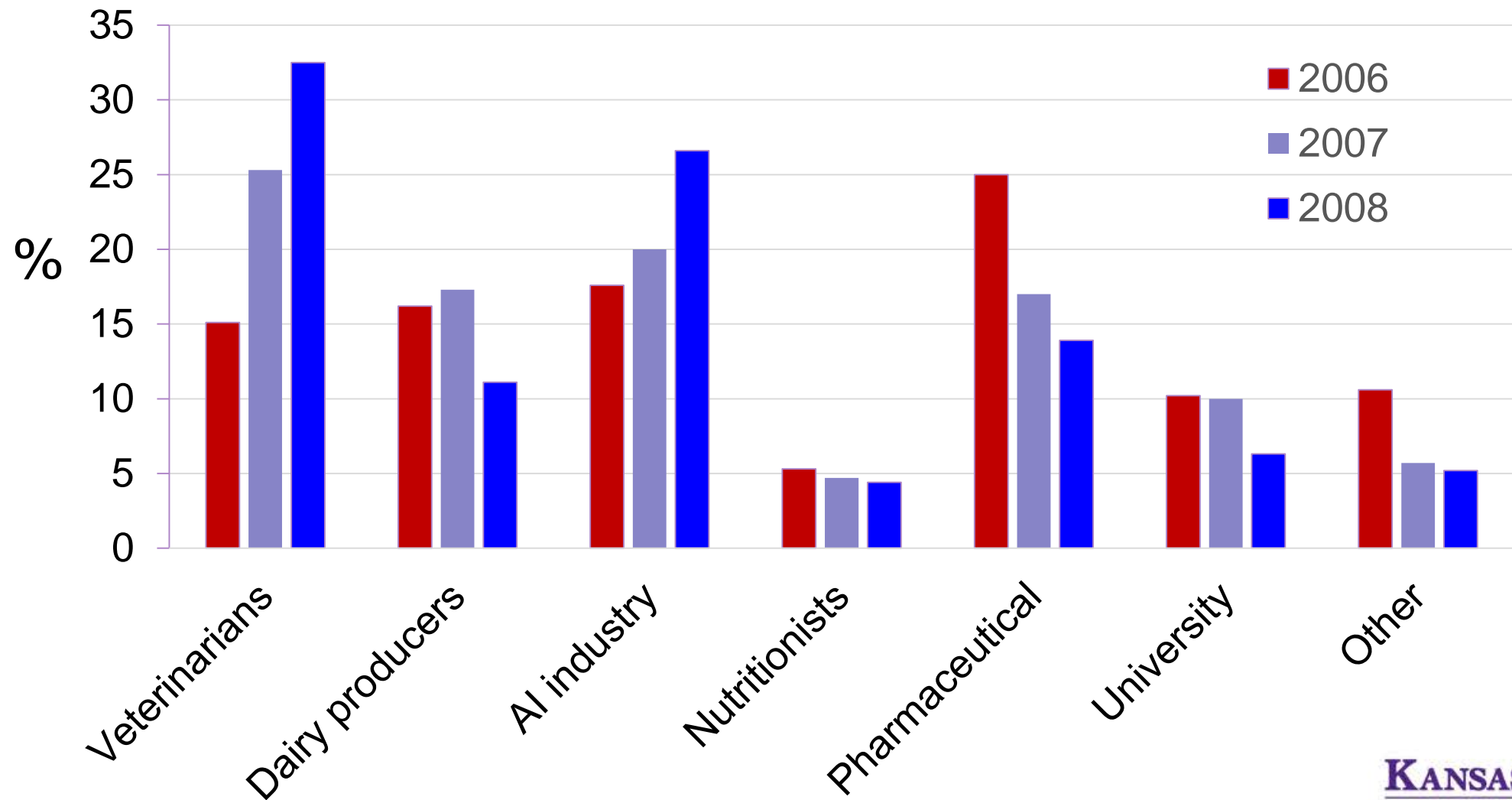


Kudos to our past presidents . . .

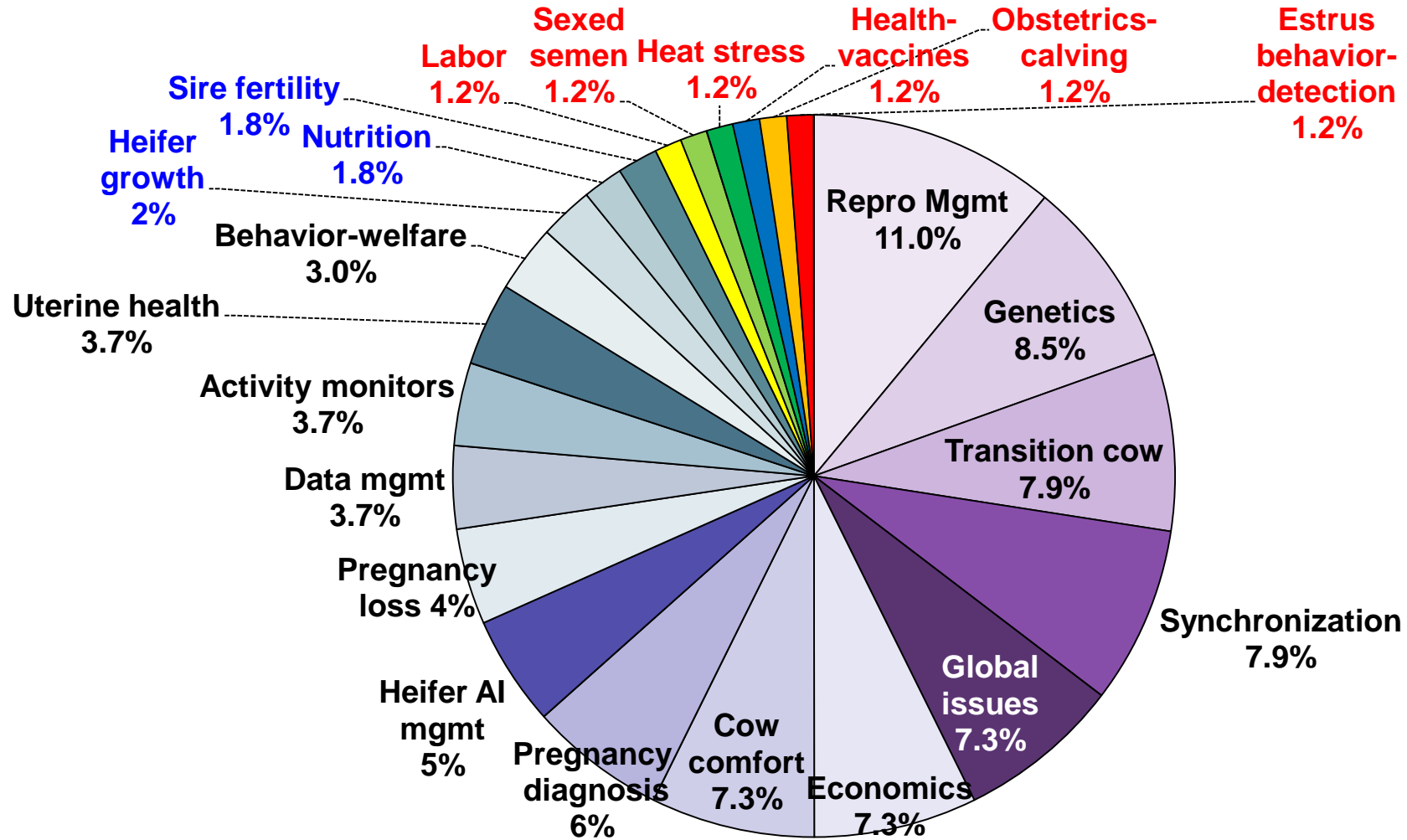
Jose Santos	University of Florida	2006 – 2007
Ray Nebel	Select Sires	2007 – 2008
Matt Lucy	University of Missouri	2008 – 2009
Ricardo Chebel	University of Florida	2009 – 2010
Gene Boomer	Church & Dwight	2010 – 2011
Tom Bailey	Elanco	2011 – 2012
Jeff Stevenson	Kansas State University	2012 – 2013
Neil Michael	Progressive Dairyman	2013 – 2014
Joe Dalton	University of Idaho	2014 – 2015
Stephen LeBlanc	University of Guelph	2015 – 2016



Attendance at annual meetings . . .



Speaker topics . . .



DCRC services . . .

- Reproductive AI protocols
- Newsletters
- 6 webinars
- Annual meeting
- Regular memberships
- E-memberships
- Networking opportunities



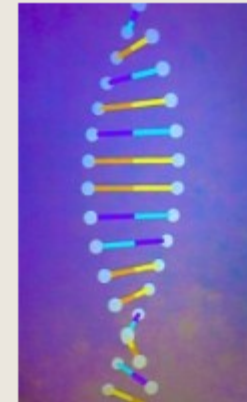
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Find out more at [\[www.dcrcouncil.org\]](http://www.dcrcouncil.org)dcrcouncil.org

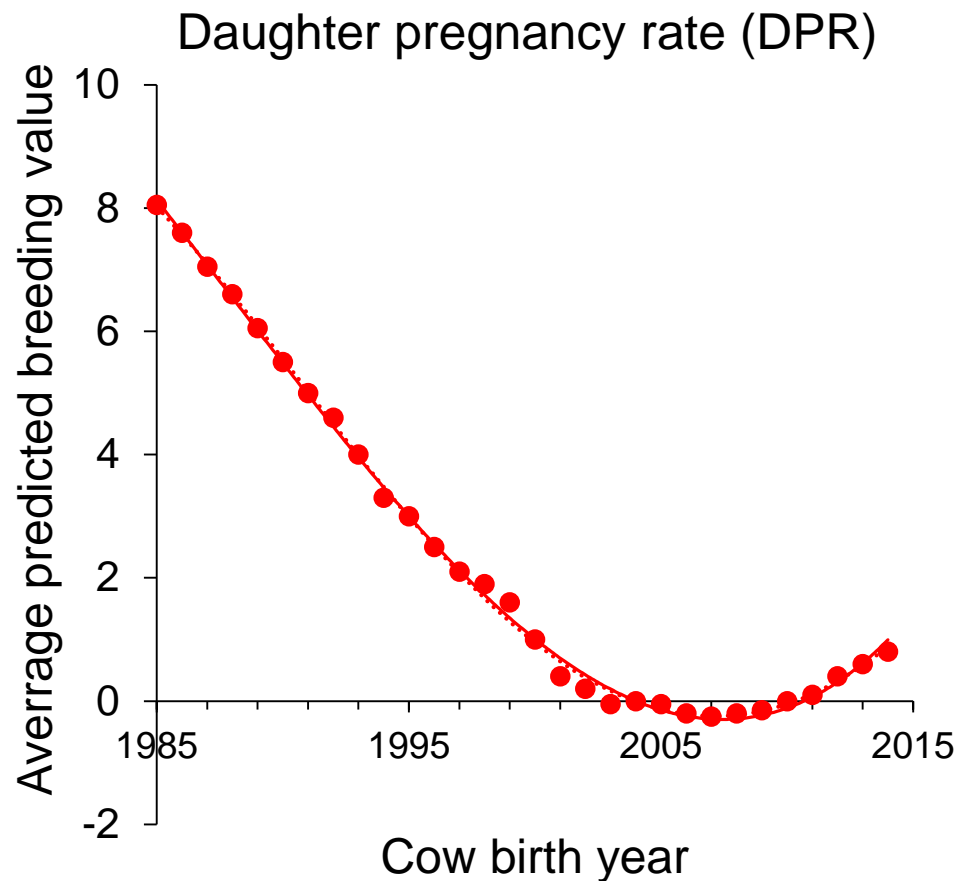
Featured Column



It's only been seven years since genomics was introduced to the dairy industry, and no one could have predicted how rapidly the technology has been embraced.

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Genetic selection differentials in US Holsteins resulting from genomic selection . . .



- Generation interval for sires of bulls reduced from 7 to < 2.5 yr and dams of bulls from 4 to 2.5 yr.
- Selection differentiations were relatively stable for yield traits; modest gains in recent years.
- **Most dramatic response to genomic selection was observed for the lowly heritable traits: DPR, productive life, and SCS.**

Garcia-Ruiz et al. 2016. PNAS.

Rates of genetic gain per yr increased from 50 to 100% for yield traits and from 3- to 4-fold for lowly heritable traits.

Summary



Genomic data included in sire summaries



3-D accelerometer to detect activity



First U.S. patent for pedometer

Sexed semen



PGF_{2α}

1979

Commercially available in the U.S.



GnRH

1980

1983

Ovsynch

1995

Presynch

1999

Resynch

2000

CIDR

2003

2005

DCRC founded

2007

2011

First ear tag-based health and activity monitoring device with temperature

Timed AI options

Sun	Mon	Tue	Wed	Thu	Fri	Sat	Presynch + Ovsynch
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Ovsynch
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	

PGF_{2α} (Wed)

PGF_{2α} (Wed)

GnRH (Mon)

PGF_{2α} (Mon)

GnRH (Wed)

AI (Thu)

14 days

12 days

Future of the DCRC depends on . . .

- Increasing our traditional and e-memberships
- Willingness of members to serve in leadership roles
- Active participation in our committees:
 - Awards
 - Education
 - Membership
 - Finance and sponsorship
 - Program
 - Nomination and Policy-Legal (past presidents)



Future of the DCRC . . .

- Current advancements to improve reproductive performance of dairy cattle reflects the challenge of integrating the disciplines of:
 - Physiology
 - Nutrition
 - Genetics (genomics)
 - Economics
 - Production medicine



Future of the DCRC . . .

Continued and future progress in the areas of:

- Cell biology
- Nutraceuticals to optimize reproductive function and lactation
- Novel and biocompatible delivery systems of biological regulatory factors
- Genomic selection
- Application of technologies to monitor biologic functions of cows and forecast treatment-management interventions
- Viable calves produced from optimal uterine environment



Thanks to our sponsors . . .

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Gold Sponsors



Award Sponsor



Bronze Sponsors



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Authors' acknowledgments . . .

Casey Hushon, C|O



Andy Skidmore, DCRC member



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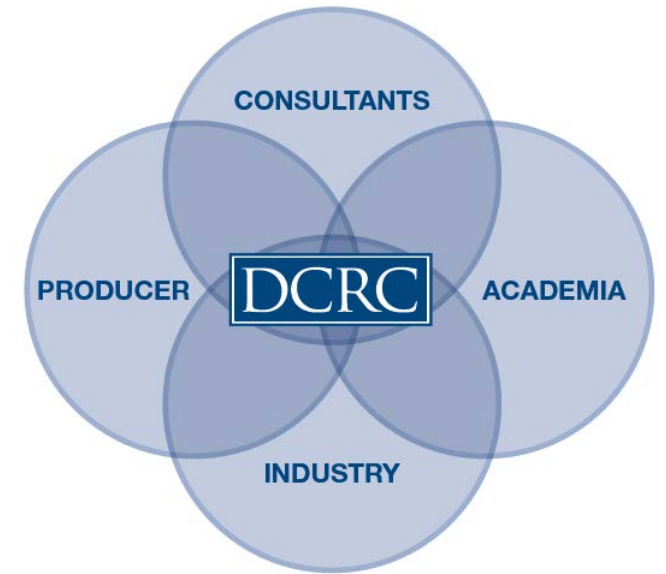
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Final thoughts . . .

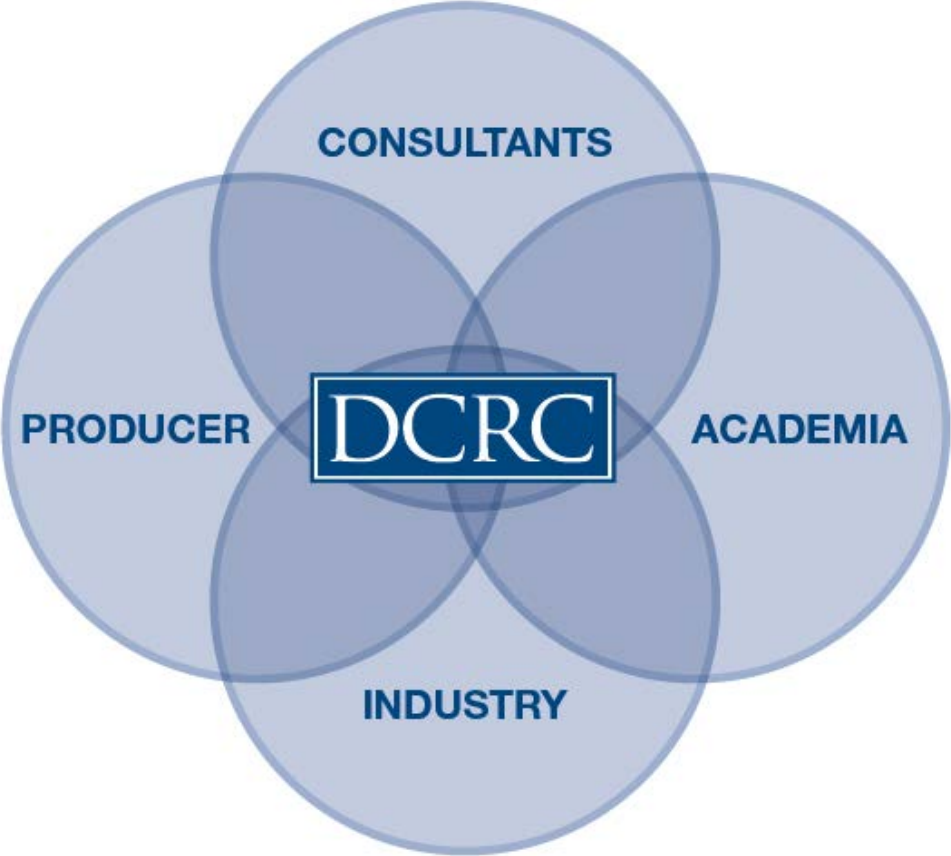
**The dairy cow as the
“Foster Mother of the
Human Race”
is a wonderful biologic
model and food producer
for mankind!**



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The end of the first 10 yr and the beginning of an even brighter DCRC future . . .



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Thank you!

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