



Why Crossbreed ??

Dr. Tom Lawlor, Holstein USA



Why
Crossbreed?





Dairy 2014

Dairy Cattle Management Practices in the United States, 2014

Published: February 2016

A.6.a. Percentage of operations and percentage of cows, by breed:

Breed	Percent operations	Std. error	Percent cows	Std. error
Holstein	89.6	(1.2)	86.0	(1.4)
Jersey	28.2	(1.6)	7.8	(1.2)
Ayrshire	4.0	(0.7)	0.2	(0.1)
Brown Swiss	10.1	(1.0)	0.8	(0.1)
Guernsey	3.3	(0.7)	0.2	(0.1)
Milking shorthorn	4.7	(0.9)	0.1	(0.0)
Other	22.7	(1.5)	4.9	(0.6)
Total			100.0	

What do those who are selling semen for crossbreeding say

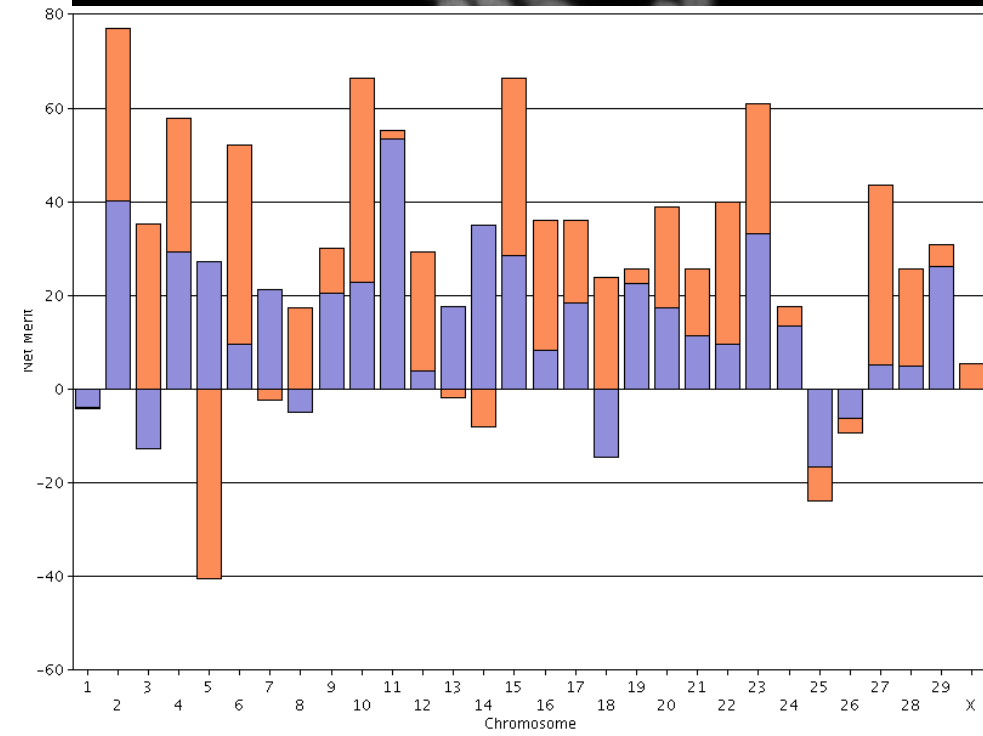
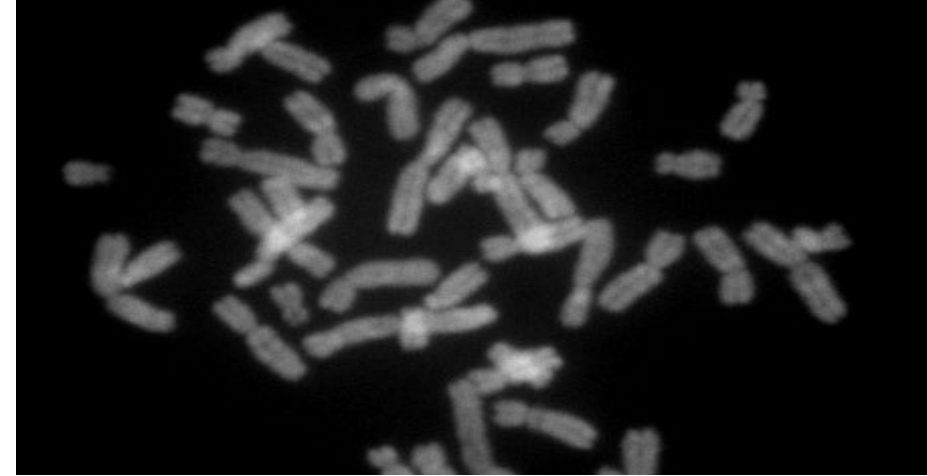
- Improved Production
- Improved Mastitis Resistance
- Improved Fertility
- Easier Calving
- Improved Survival



Photo: Hoard's Dairyman

Our breeding goals are much broader than they were 10 – 15 years ago

Do we need more promotion of the Holstein breed?



HOLSTEIN History

Lots of emphasis – all around the world – Health & Fertility

- 2002

Put more emphasis on reducing Somatic Cell Score.

- 2005 - 2011:

Several improvements made to improve health and fertility

Productive Life, Daughter Pregnancy Rate, Calving Ease, Calf Survival

- 2014:

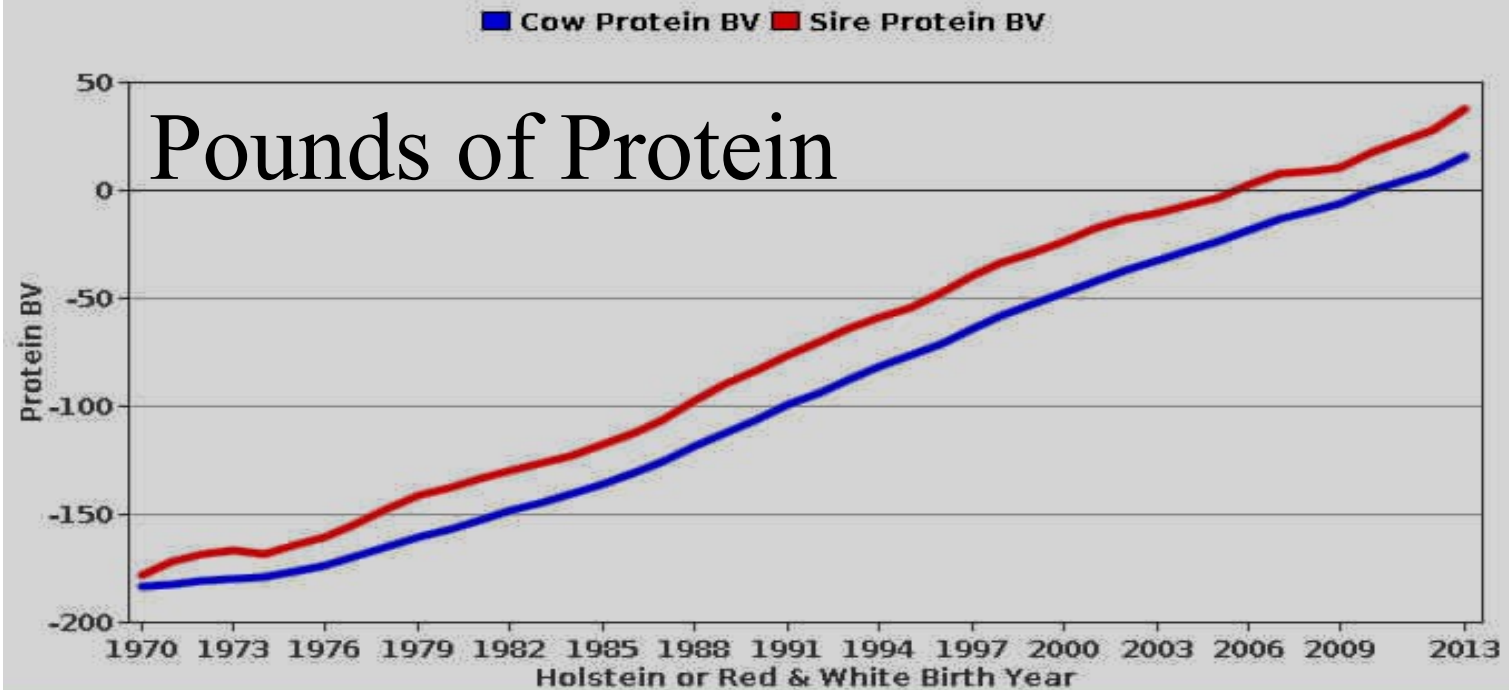
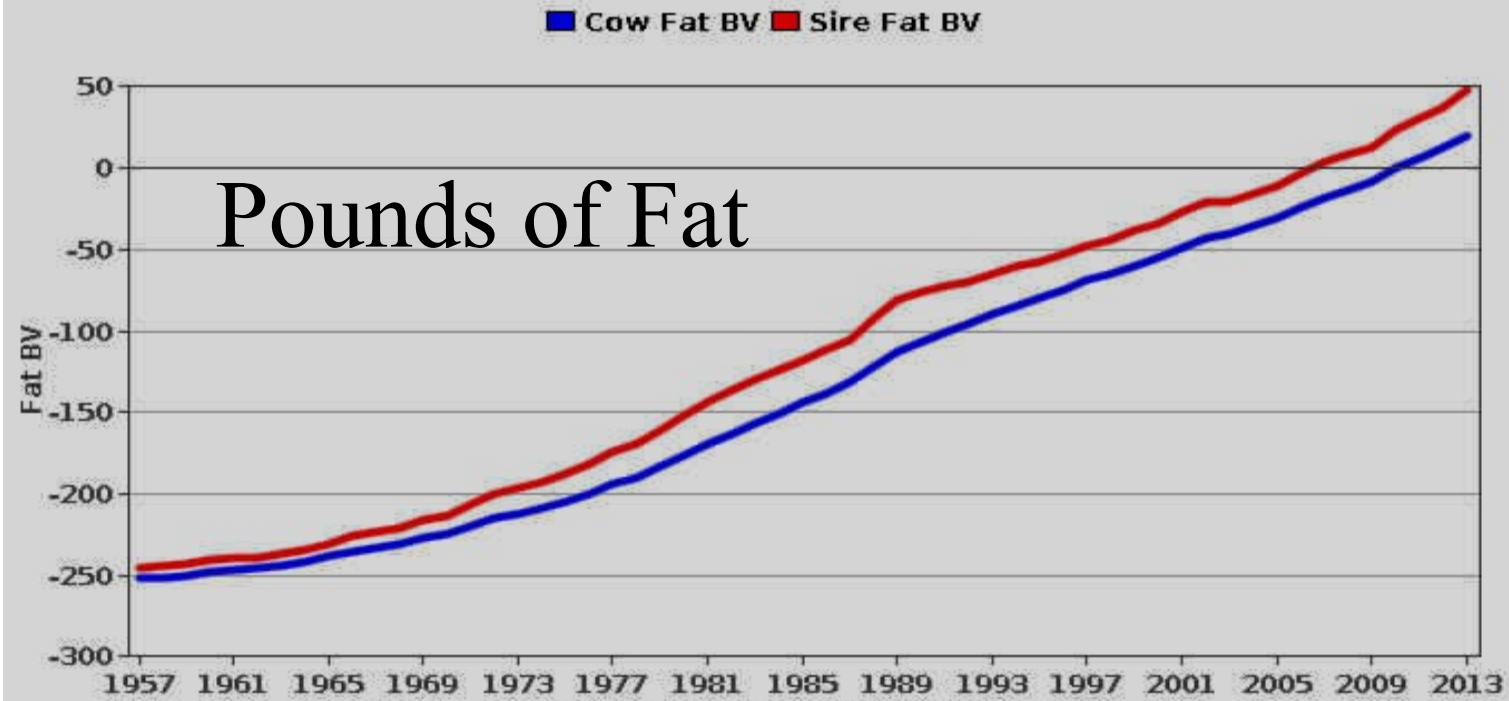
Fertility Index and Feed Efficiency added

$\left[\frac{27(\text{PTAP})}{19} + \frac{16(\text{PTAF})}{22.5} + \frac{3(\text{FE})}{44} + \frac{8(\text{PTAT})}{.73} - \frac{1(\text{DF})}{1} + \frac{11(\text{UDC})}{.8} + \frac{6(\text{FLC})}{.85} + \frac{7(\text{PL})}{1.51} - \frac{5(\text{SCS})}{.12} + \frac{13(\text{FI})}{1.25} - \frac{2(\text{DCE})}{1} - \frac{1(\text{DSB})}{.9} \right] 3.9 + 2187$											
Where:	PTAP = PTA Protein	SCS = PTA Somatic Cell Score	UDC = Udder Composite								
	FE = Feed Efficiency	DCE = PTA Daughter Calving Ease	PL = PTA Productive Life								
	DF = STA Dairy Form	PTAF = PTA Fat	FI = Fertility Index								
	FLC = Feet & Legs Composite	PTAT = PTA Type	DSB = PTA Daughter Stillbirth								

Actual Lifetime Performance.
 Selected by April, 2015 **TPI** formula
Cows born 2007-2009

	TPI	Fat & Protein per day of life	Lifetime	Somatic Cell Score	Final Score
Top Quartile	1692	3.59	4yrs, 9 months, 21days	2.20	79.3
2 nd	1530	3.11	4yrs, 8 months, 1day	2.37	77.8
3 rd	1421	2.79	4yrs, 6 months, 16days	2.51	76.9
Low Quartile	1284	2.46	4yrs, 4 months, 17days	2.72	75.4

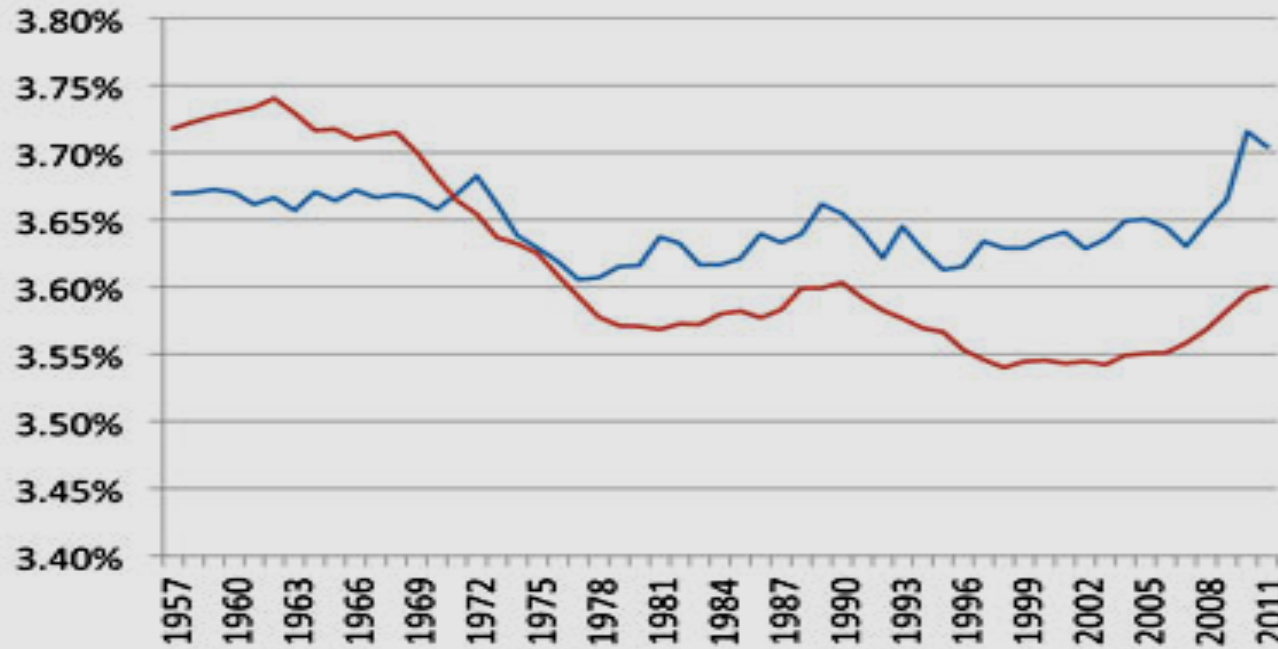
**Power of selection
can be seen by our
genetic progress**



Components - % Fat & % Protein

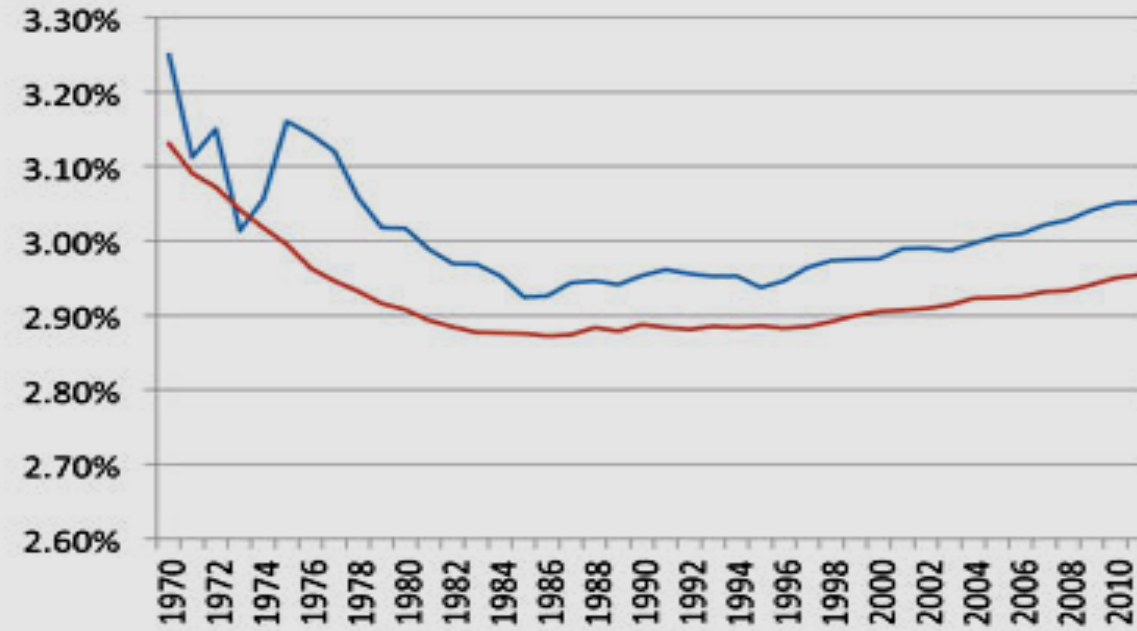
U. S. Holstein Genetic and Phenotypic Trend

% Fat

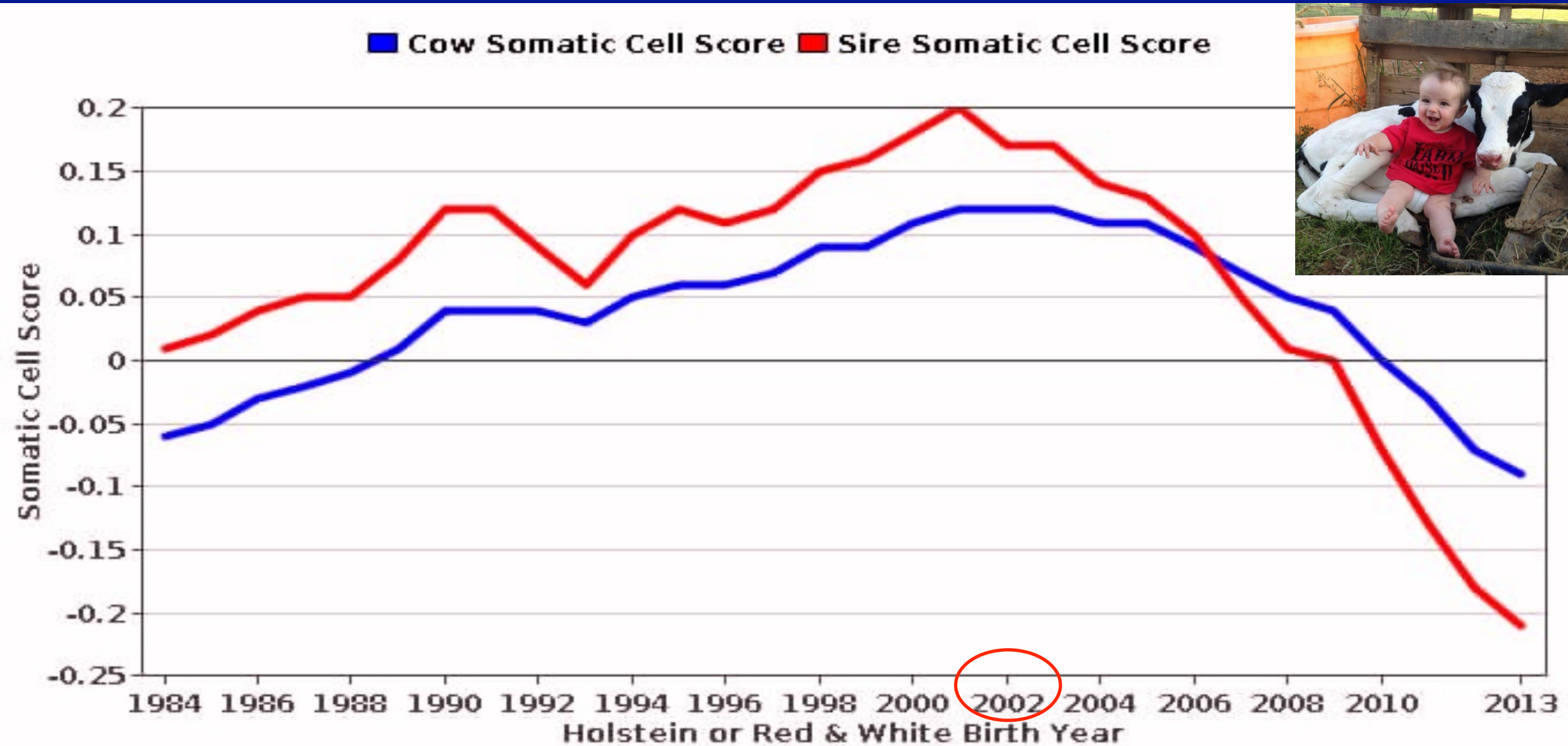


U.S. Holstein Genetic and Phenotypic Trend

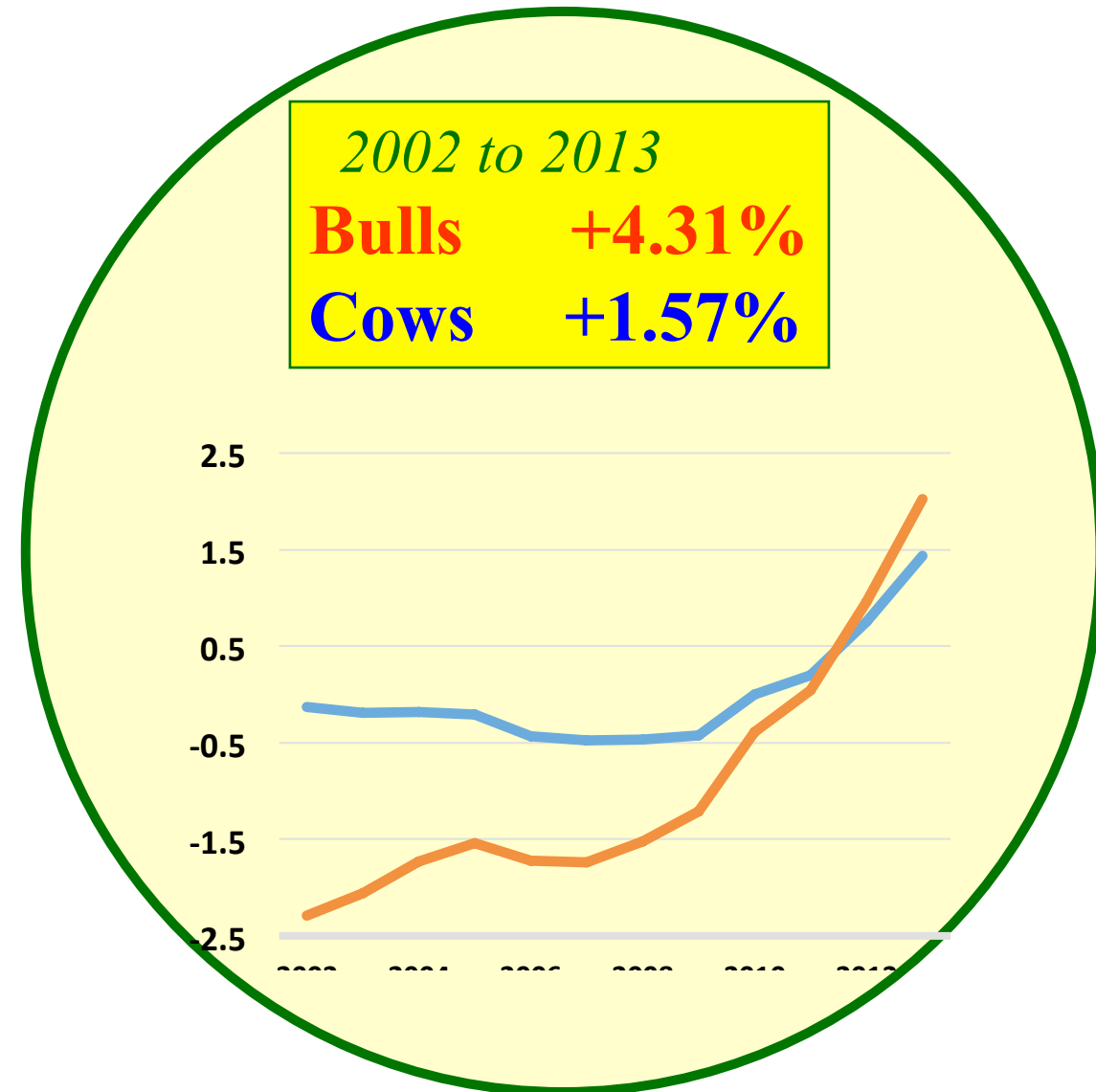
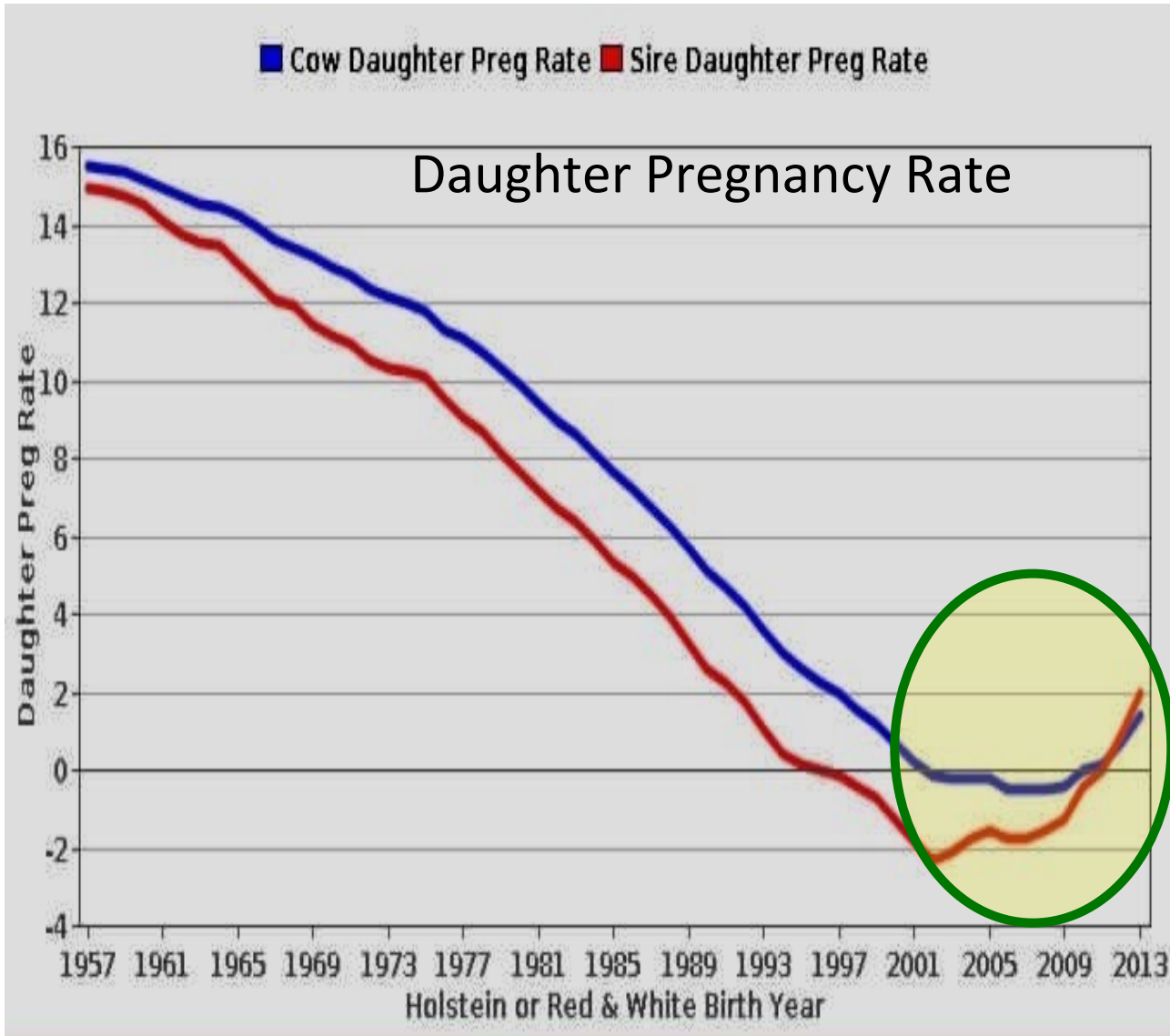
% Protein

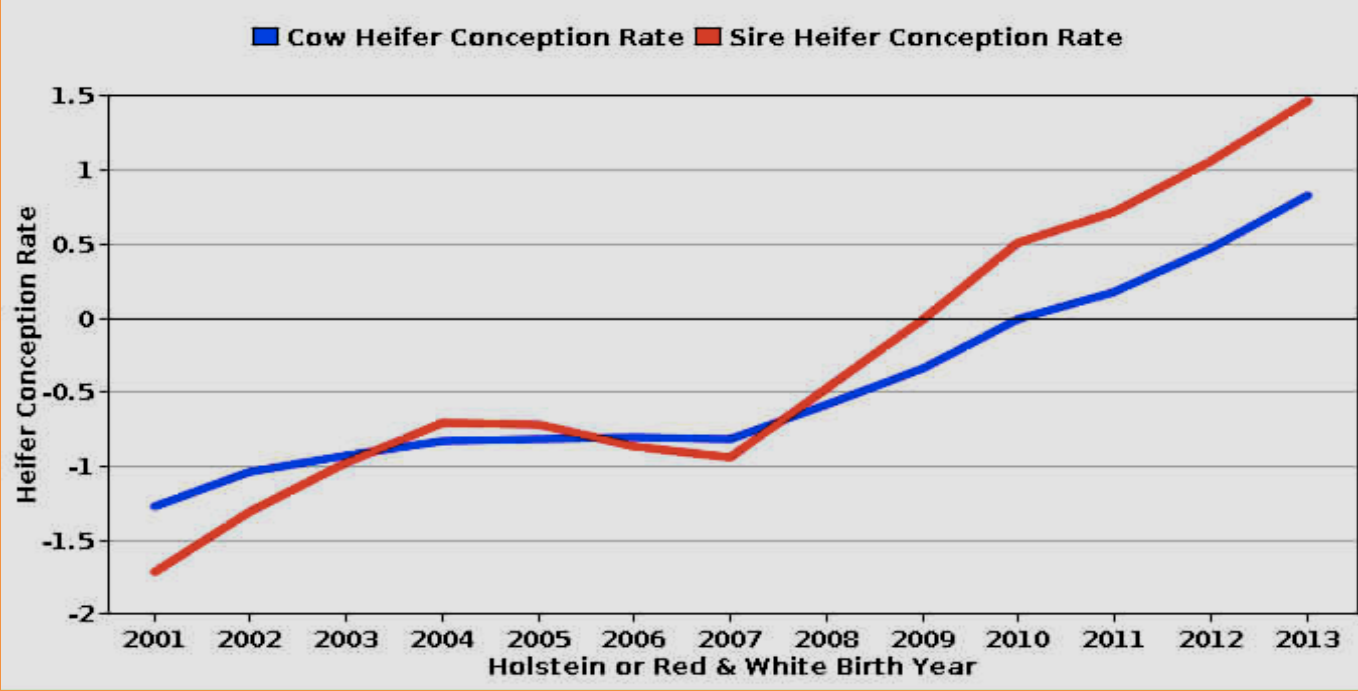


Somatic Cell Score – *A Great Success Story*



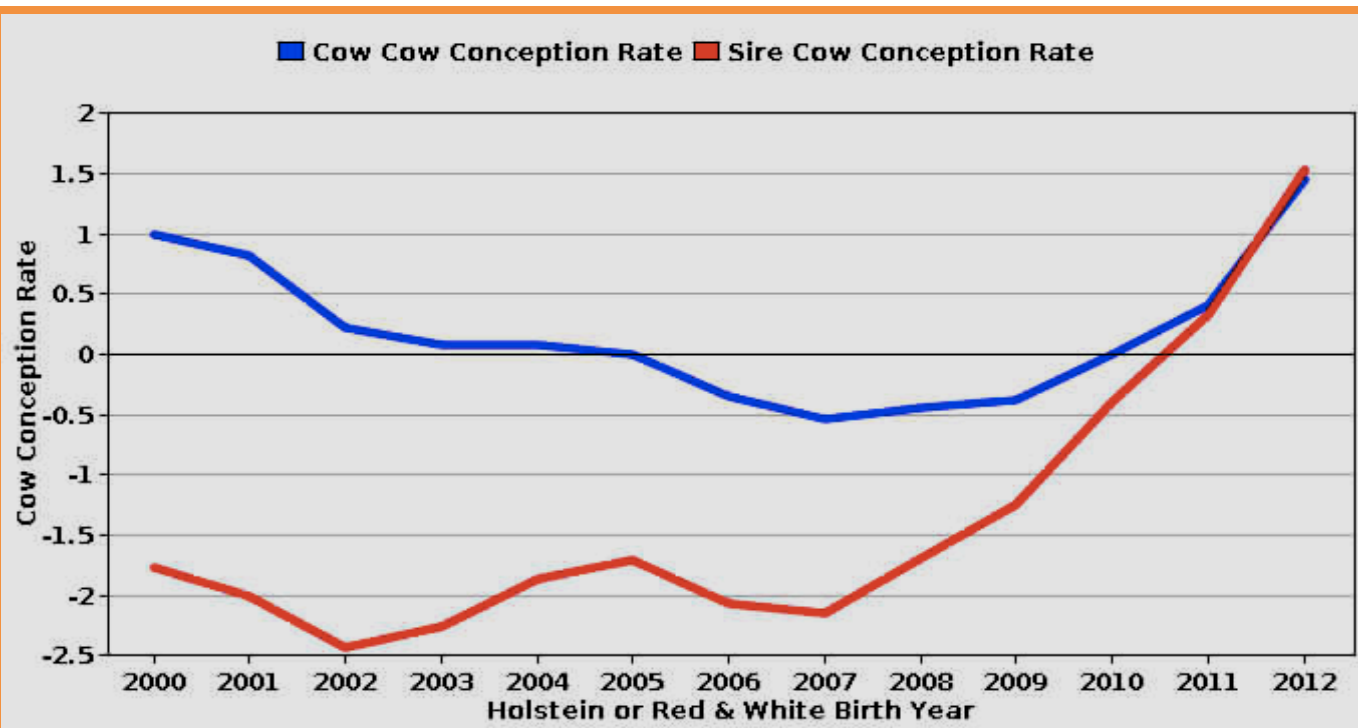
Impressive progress in Fertility last few years





HEIFER Conception Rate

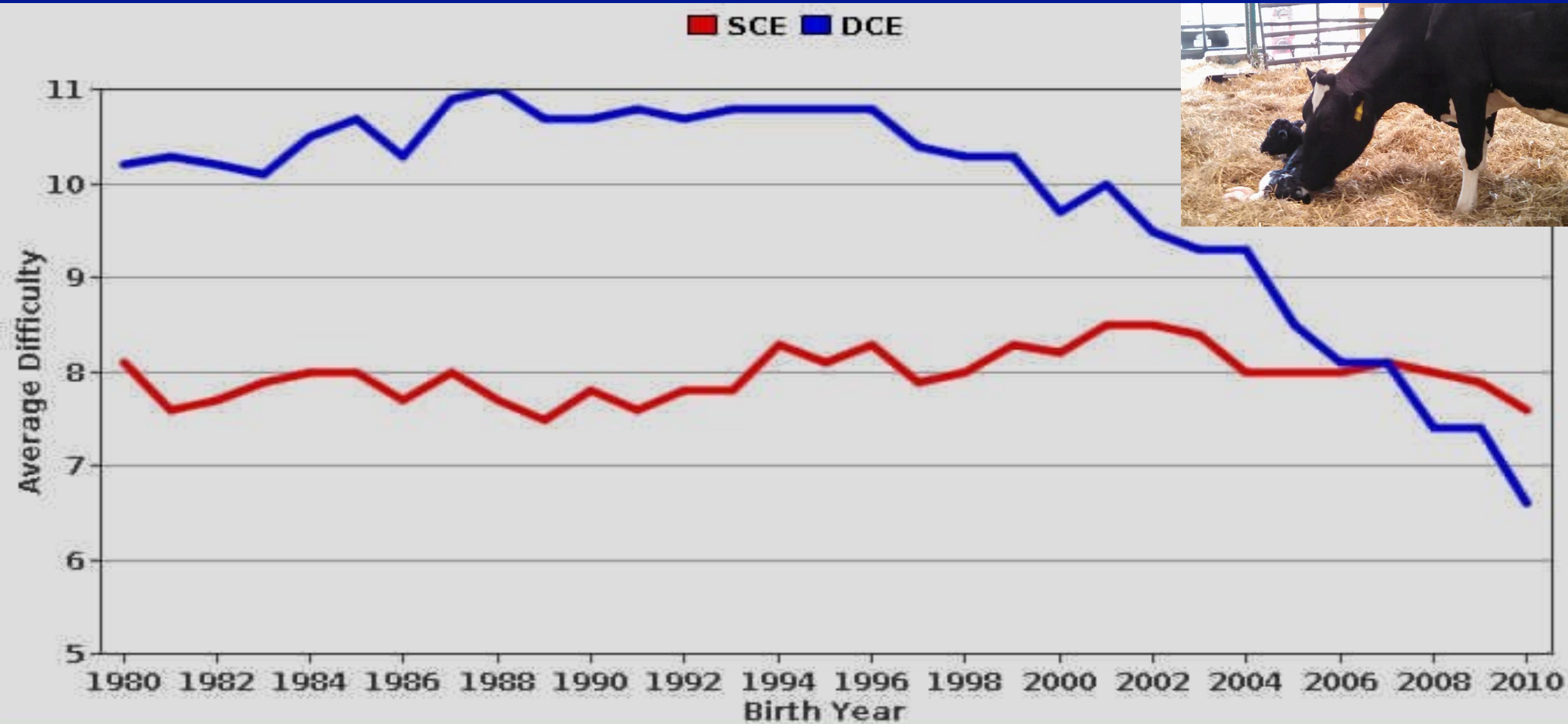
Bulls +2.47%
Cows +1.86%



COW Conception Rate

Bulls +3.97%
Cows +1.23%

Easier Calving



Cow livability - *New Trait*

- Reasons for disposal - reported by DHIA since 1970
- Cows that are sold for beef are more valuable

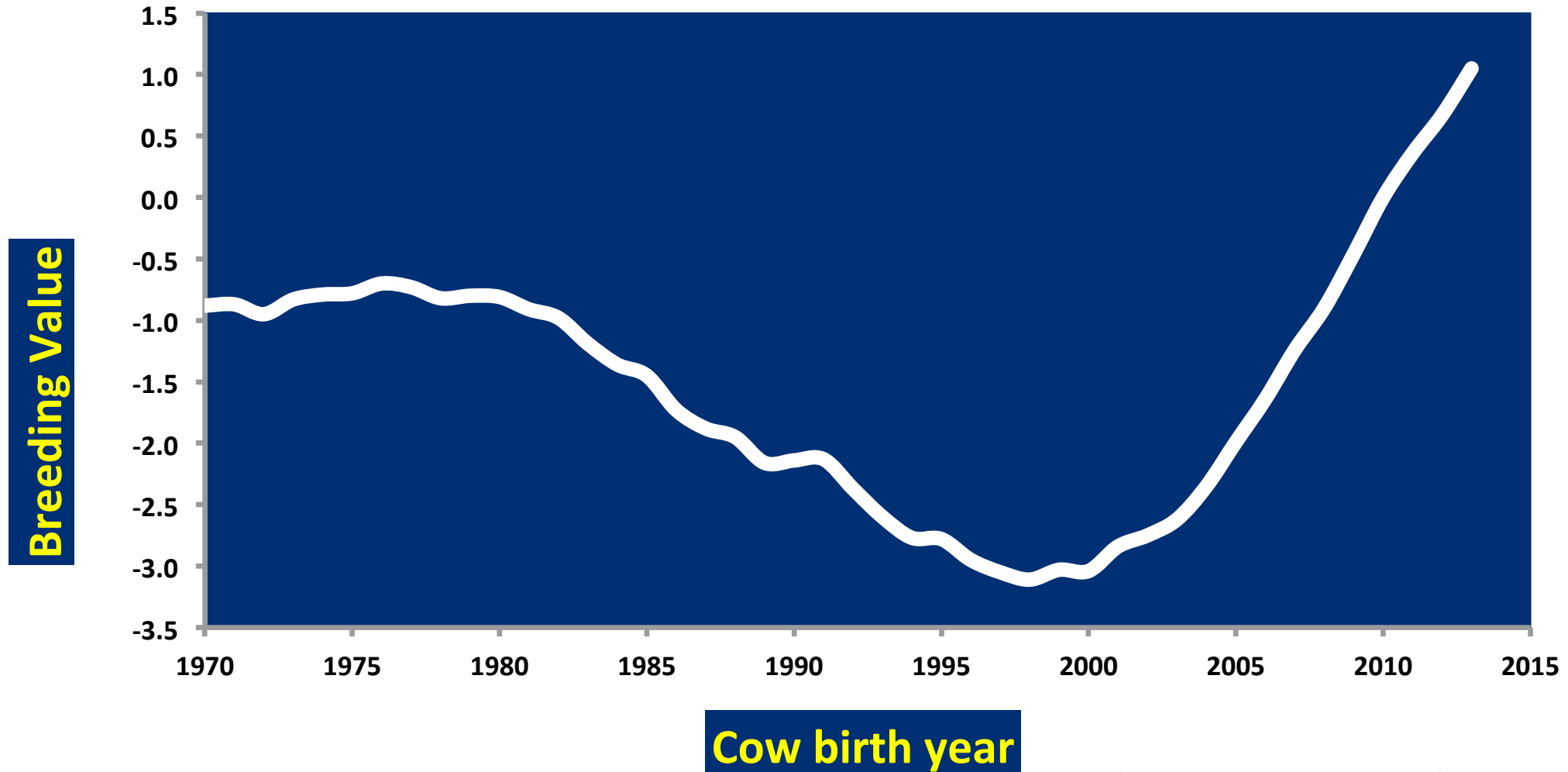
Definition- Reverse of mortality:

0 = died this lactation

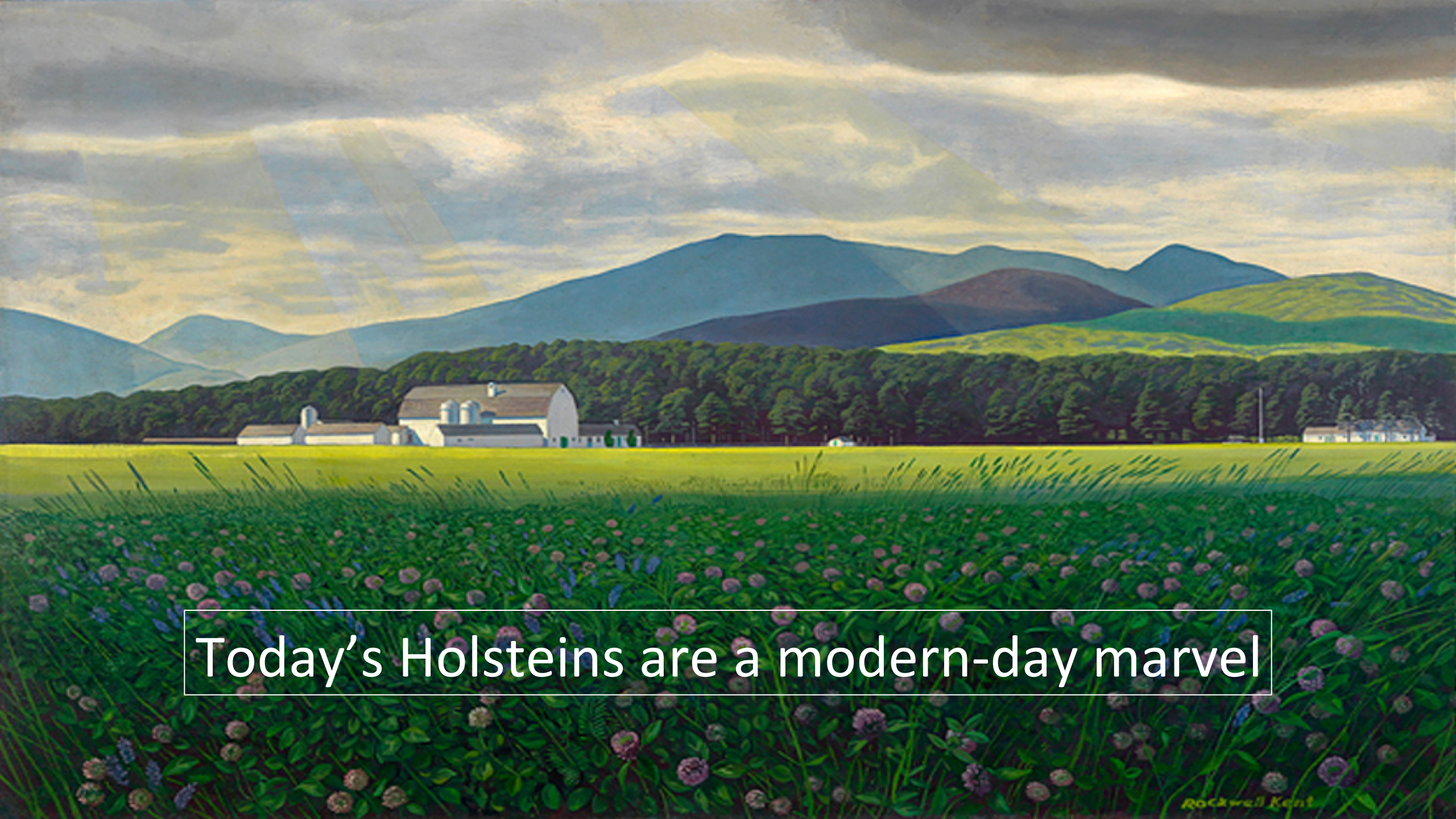
100 = lived this lactation

Genetic correlation with Productive Life is +0.50

Genetic trend in Cow Livability - Holsteins



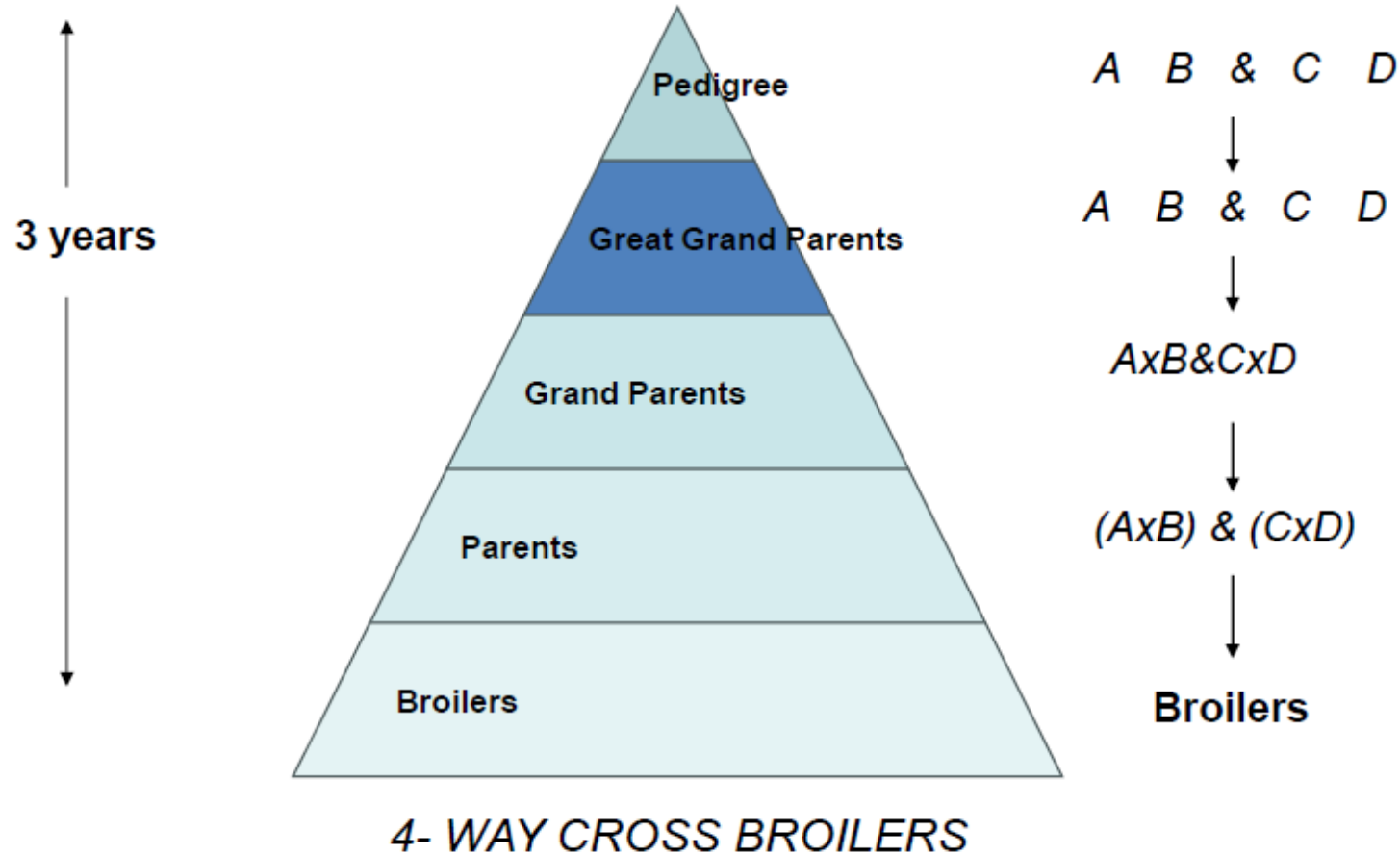
Source: CDCB-USDA February 2016



Today's Holsteins are a modern-day marvel

We are not like chickens or pigs !!!

Pedigree to Commercial- complicated



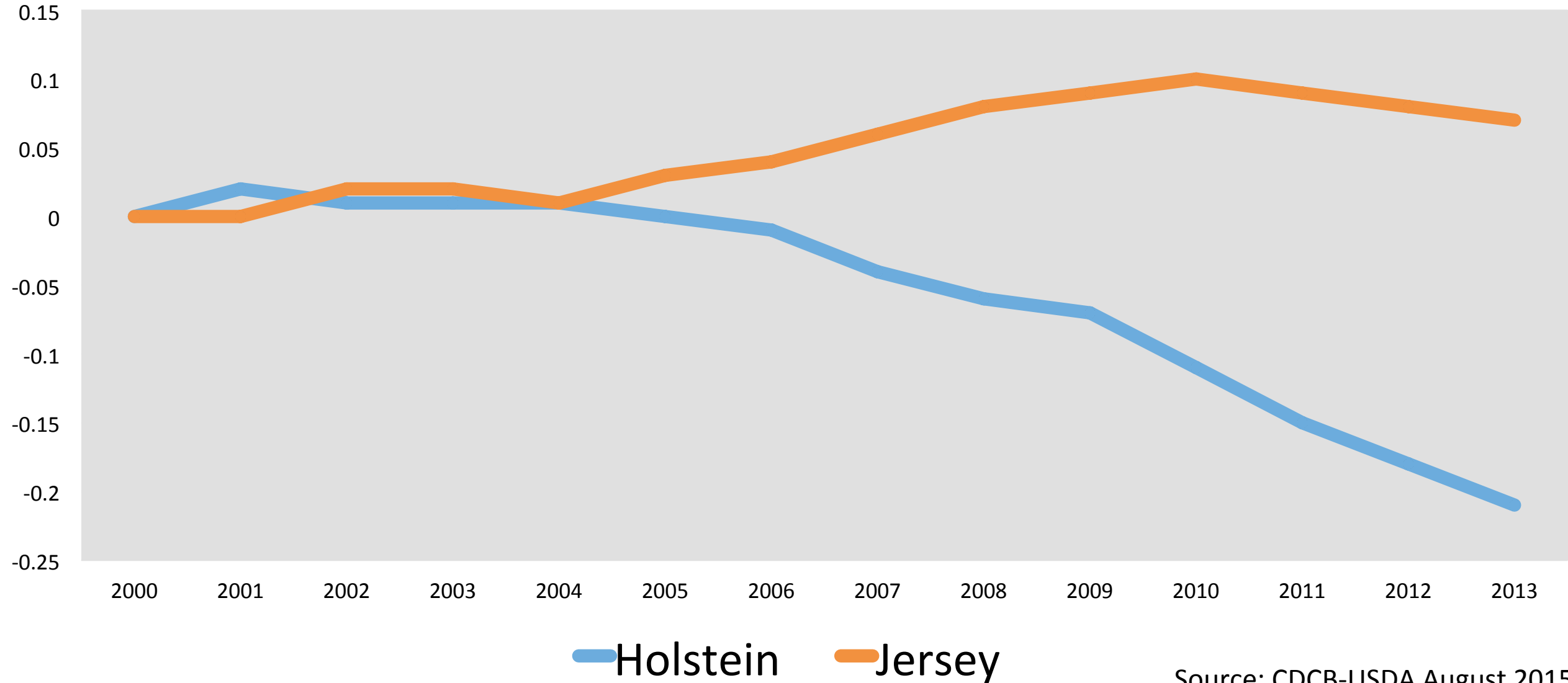


No dairy breeds
are being
selected for
crossbreeding



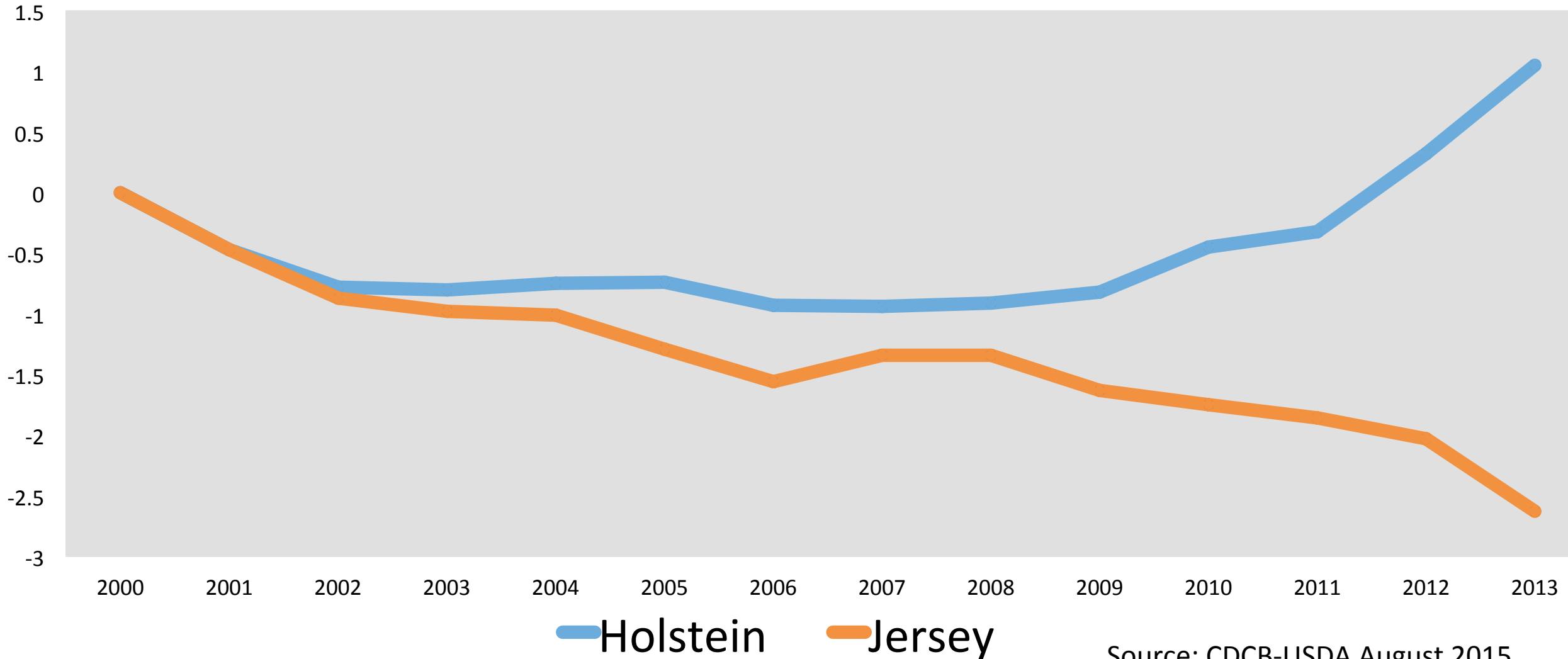
- Holsteins are being bred for all markets and environments.
- Other breeds are letting their strengths slip away as they try to catch up.

Genetic Progress of Holsteins and Jerseys Last 13 years – Somatic Cell Score



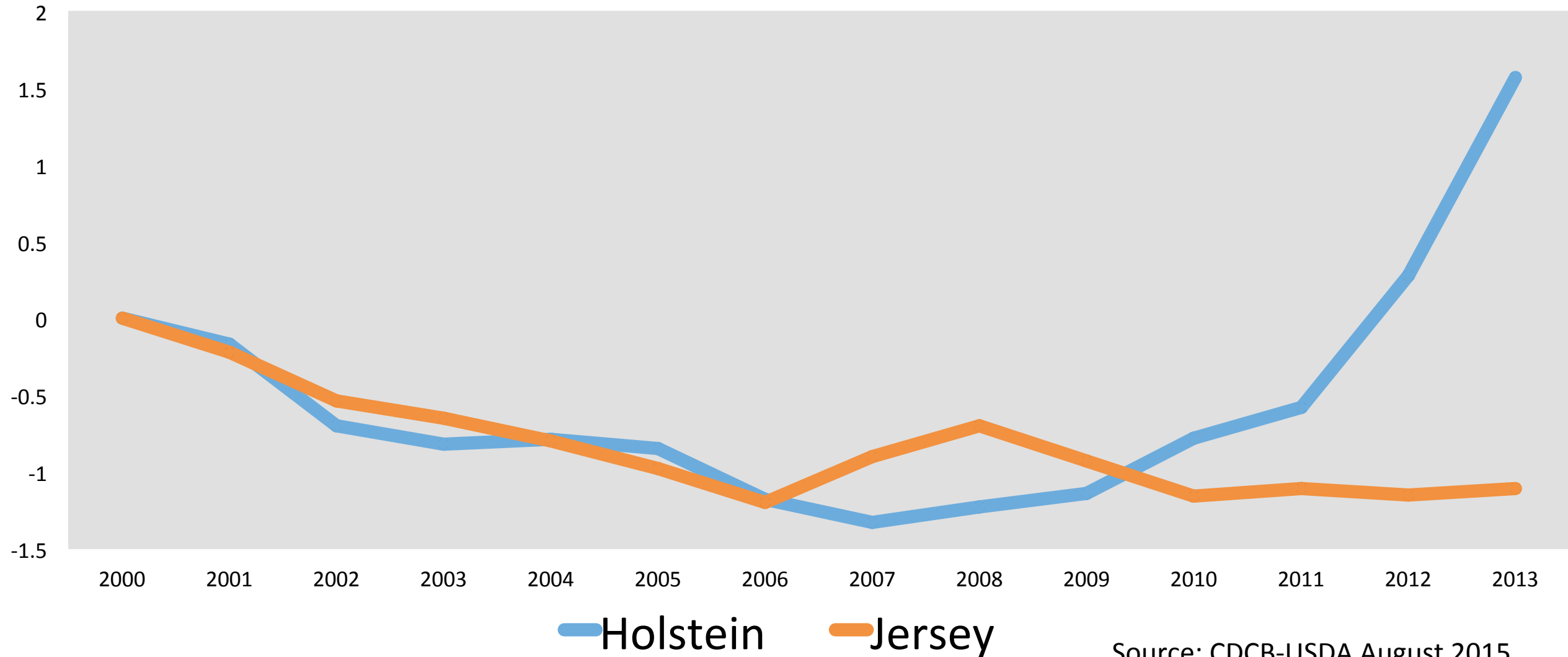
Source: CDCB-USDA August 2015

Genetic Progress of Holsteins and Jerseys Last 13 years – Daughter Pregnancy Rate



Source: CDCB-USDA August 2015

Genetic Progress of Holsteins and Jerseys Last 13 years – Cow Conception Rate

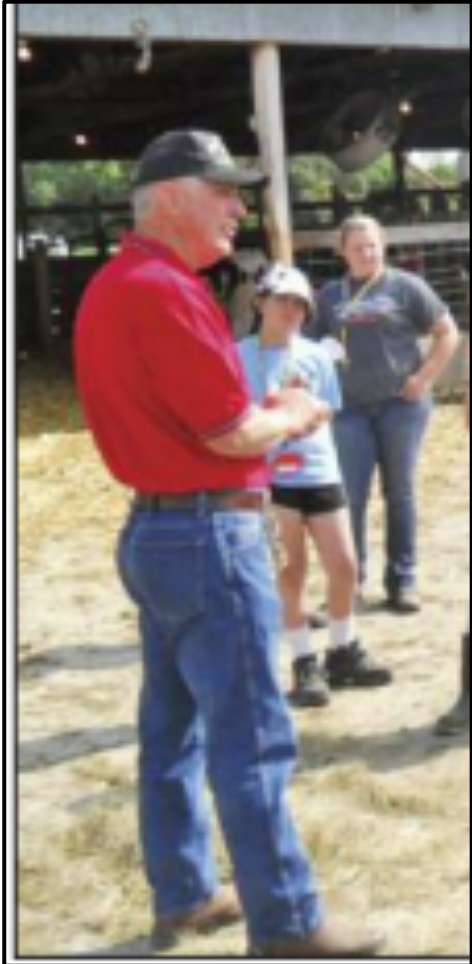


Source: CDCB-USDA August 2015

Many misconceptions about crossbreeding

- Dairy is not a crossbreeding industry.
No one is selecting for crossbred performance.
- Lack of understanding of using purebred PTAs for crossbreeding.

Former HAUSA President, Randy Gross teaches a class on Dairy Breeds and Breeding.



Randy Gross



South Dakota
State University

**What's the expected
Protein Yields of top bulls
of different breeds when
mated to cows of different
breeds?**

USDA Evaluations for Proven Holstein Sires Sorted by Net Merit – December 2015

Name	NM\$	REL NM\$	PTA Milk lbs	PTA Fat lbs	PTA Fat %	PTA Protein lbs	PTA Protein %	REL Yield	Herds	Daughters
SEAGULL BAY SUPERSIRE-ET	936	95	2359	110	0.08	71	0.00	99	630	2012

USDA Evaluations for Proven Jersey Sires Sorted by Net Merit – December 2015

Name	NM\$	REL NM\$	PTA Milk lbs	PTA Fat lbs	PTA Fat %	PTA Protein lbs	PTA Protein %	REL Yield	Herds	Daughters
SUNSET CANYON MACHETE-ET	546	93	1089	47	-0.03	41	0.01	98	79	858

COUNCIL ON DAIRY CATTLE BREEDING

December 2015 across breed base adjustment parameters

Breeding value (2*PTA) differences from Holstein

Breed	Milk	Fat	Protein	Productive Life	Somatic Cell Score	Daughter Pregnancy Rate	Heifer Conception Rate	Cow Conception Rate
Ayrshire	-5138	-147	-136	-0.3	-0.08	2.4	-6.3	0.1
Brown Swiss	-4111	-96	-77	-0.6	0.02	0.0	-8.6	-4.4
Guernsey	-5910	-89	-145	-8.5	0.27	0.0	-10.4	-7.8
Jersey	-5296	-50	-89	2.6	0.32	6.2	-1.3	5.2
Milking Shorthorn	-5390	-196	-160	-1.2	0.09	4.7	-1.4	2.7

PTA differences from Holstein

Breed	Milk	Fat	Protein	Productive Life	Somatic Cell Score	Daughter Pregnancy Rate	Heifer Conception Rate	Cow Conception Rate
Ayrshire	-2569	-74	-68	-0.2	-0.04	1.2	-3.1	0.1
Brown Swiss	-2056	-48	-39	-0.3	0.01	0.0	-4.3	-2.2
Guernsey	-2955	-44	-73	-4.2	0.13	0.0	-5.2	-3.9
Jersey	-2648	-25	-44	1.3	0.16	3.1	-0.6	2.6
Milking Shorthorn	-2695	-98	-80	-0.6	0.05	2.3	-0.7	1.3

Standard deviation ratio

Breed	Milk	Fat	Protein	Productive Life	Somatic Cell Score	Daughter Pregnancy Rate	Heifer Conception Rate	Cow Conception Rate
Ayrshire	0.91	0.91	0.91	1.00	1.07	1.00	1.00	1.00
Brown Swiss	0.95	0.95	0.95	1.00	0.99	1.00	1.00	1.00
Guernsey	0.91	0.91	0.91	1.00	1.12	1.00	1.00	1.00
Holstein	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jersey	0.95	0.95	0.95	1.00	0.91	1.00	1.00	1.00
Milking Shorthorn	0.75	0.75	0.75	1.00	1.07	1.00	1.00	1.00

Trait means for base cows

Breed	Milk	Fat	Protein	Productive Life	Somatic Cell Score	Daughter Pregnancy Rate	Heifer Conception Rate	Cow Conception Rate
Ayrshire	18591	723	587	28.4	2.43	25.7	47.2	39.0
Brown Swiss	22640	916	751	27.2	2.55	24.5	46.7	31.5
Guernsey	17454	781	569	25.9	3.01	24.0	41.4	28.3
Holstein	26996	1006	822	26.4	2.37	28.5	57.2	35.0
Jersey	19731	938	709	29.8	2.77	35.3	55.0	41.1
Milking Shorthorn	18846	696	583	26.6	2.75	29.5	56.3	40.3

Initial 1960 heterosis value

Milk	Fat	Protein	Productive Life	Somatic Cell Score	Daughter Pregnancy Rate	Heifer Conception Rate	Cow Conception Rate
142	20	10	0.58	0.02	2.63	1.60	2.57

Regression per 1% inbreeding

Milk	Fat	Protein	Productive Life	Somatic Cell Score	Daughter Pregnancy Rate	Heifer Conception Rate	Cow Conception Rate
-63.7	-2.36	-1.88	-0.27	0.00	-0.13	-0.12	-0.16

Base Cow Expected Future Inbreeding (EFI)

Breed	EFI
Ayrshire	6.3
Brown Swiss	6.9
Guernsey	7.5
Holstein	6.0
Jersey	7.2
Milking Shorthorn	2.3

COUNCIL ON DAIRY CATTLE BREEDING

Expected Protein Yields of top bulls of different breeds when mated to cows of different breeds.

	Mate	Expected Protein Yield
Supersire Holstein bull	Holstein Cow	71 lbs more than average Holstein
	Jersey Cow	133 lbs more than average Jersey
	Ayrshire Cow	148 lbs more than average Ayrshire
Machette Jersey bull	Jersey Cow	41 lbs more than average Jersey
	Holstein Cow	20 lbs more than average Holstein
	Ayrshire Cow	43 lbs more than average Ayrshire

PTA Protein of 20 pounds is not very impressive

There's a lot of Holstein bulls that have a
PTA Protein more than of 20 pounds.

PLUS

Positive for Feed Efficiency

Positive for Fertility Index

Positive for PTA Type

Low Somatic Cell Score

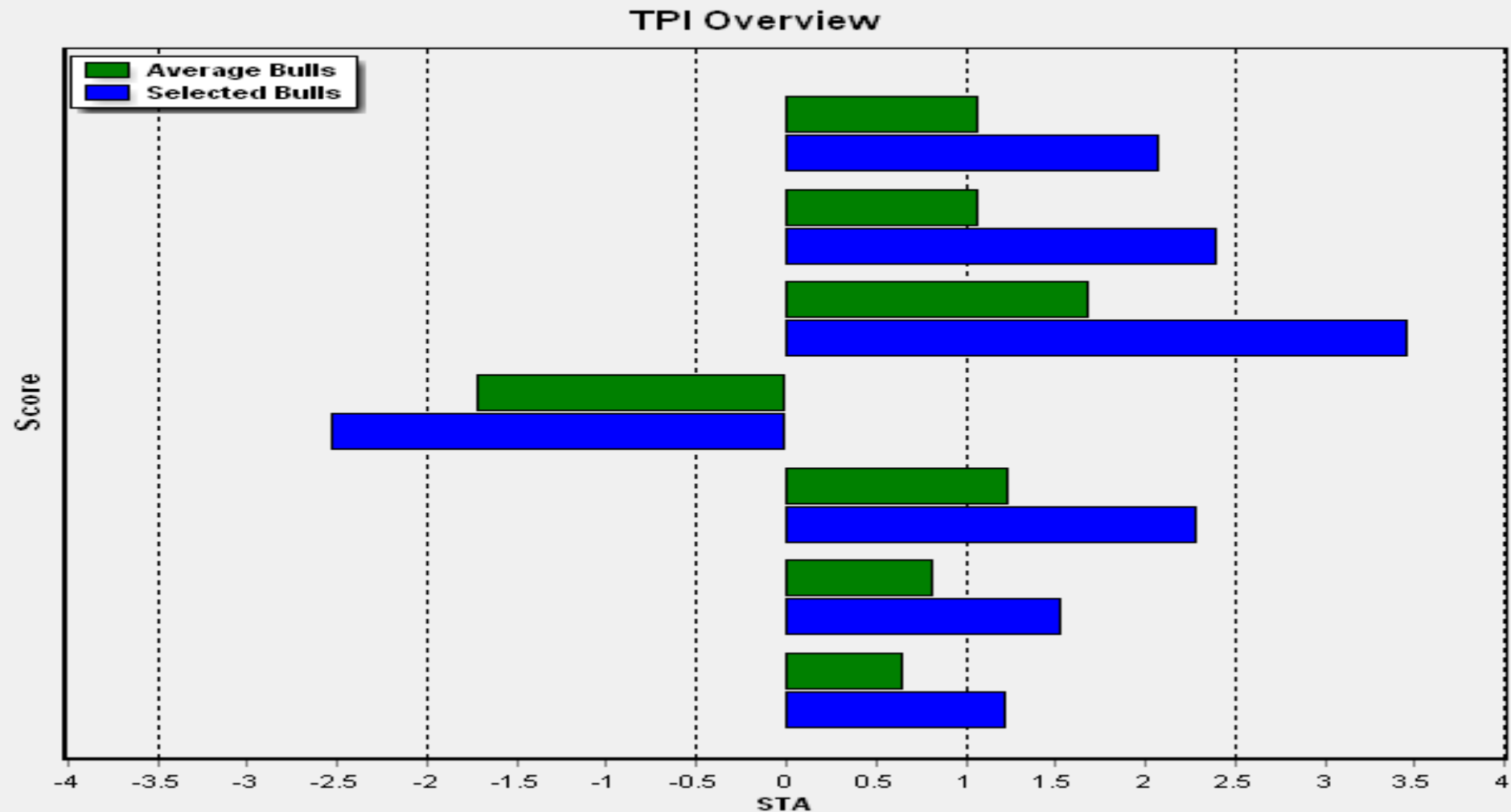
Easy Calving

1,202 Holstein bulls are available



Trait: TPI Overview

TPI:	1998	Overall
	2427	Selected
STA Protein:	1.07	Overall
	2.08	Selected
STAFat:	1.08	Overall
	2.4	Selected
Productive Life:	1.69	Overall
	3.47	Selected
Somatic Cell Score:	-1.72	Overall
	-2.53	Selected
Final Score:	1.24	Overall
	2.29	Selected
Udder Comp.:	0.83	Overall
	1.54	Selected
Ft&Leg Comp.:	0.66	Overall
	1.23	Selected

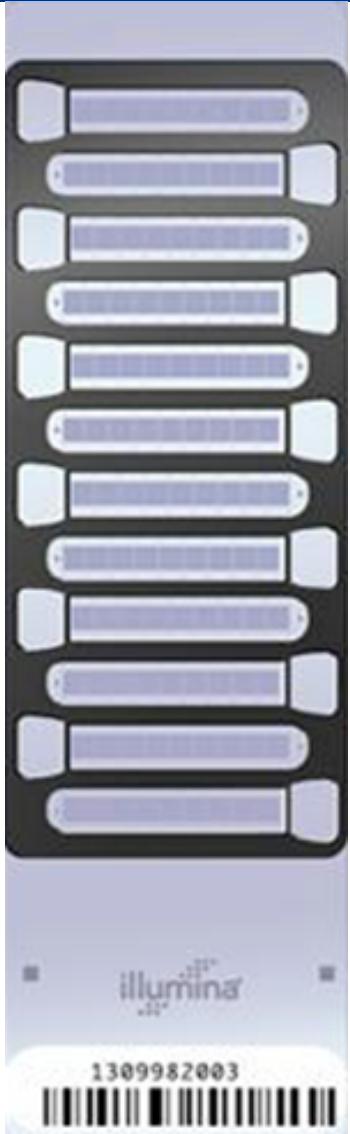


Renaissance Period

Rapid gains in health, fertility and production



Genomic testing gives us an extra boost in improving the lowest heritable traits



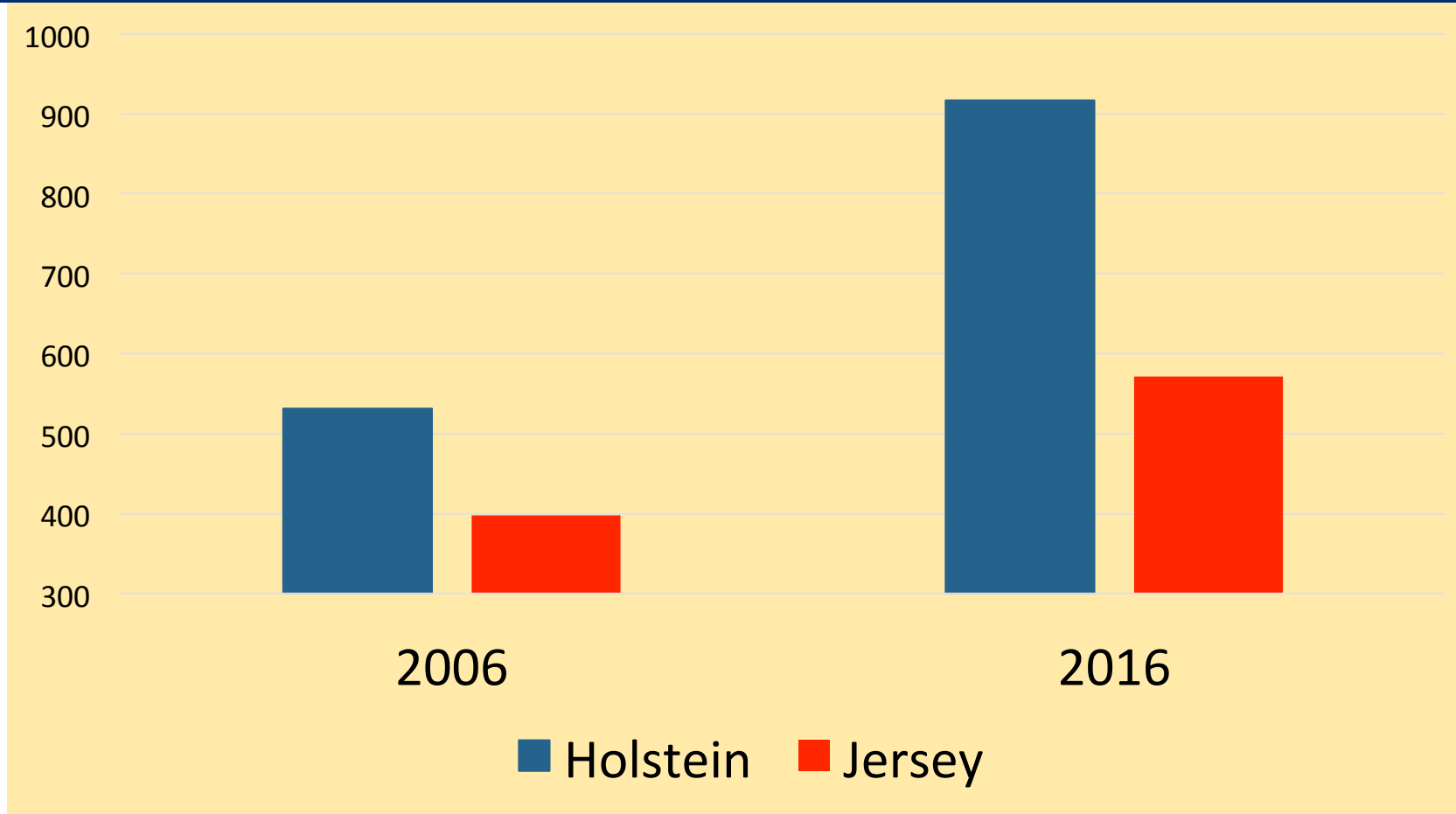
Trait	Extra Daughter Equivalents from SNP effects
Production	25
Conformation	25
Calving Ease	38
Somatic Cell Score	58
Productive Life	80
Fertility	140



USDA Evaluations for Holstein & Jersey

Top 50 Bulls - Sorted by Net Merit

November, 2006 and December 2016



Holstein's superiority over Jersey is GROWING with the use of genomics

Lots of opportunity to improve your herd
from within the Holstein breed.

1,202 available bulls from the US
and Canada

When you add in bulls from
Germany, Netherlands, France,
Australia, New Zealand, and others

There's NO reason to consider
crossbreeding.



Holsteins

Profit-oriented farmers of today
know that the breed of the future is Holsteins.

Well proven – and only getting better !

