

# **ABS Sexcel® Technology: Make better breeding decisions and maximise genetic gain**

Dr. Martin Prieto

Genetic and technical services

Profit From Genetic Progress



# Introduction to Genus & ABS

- Genus Plc, the parent company, is listed on the London Stock Exchange (GNS on FTSE 250)
- Genus has 4 main business entities
  - ABS - the world's largest bovine genetic company
  - Intelligen, Biosystem engineering Sexed Bovine Semen
  - IVB - the largest IVF business in the world
  - Promar – International Agri-Food consultancy

# Our Vision

*“Pioneering  
animal genetic  
improvement  
to help nourish  
the world”*



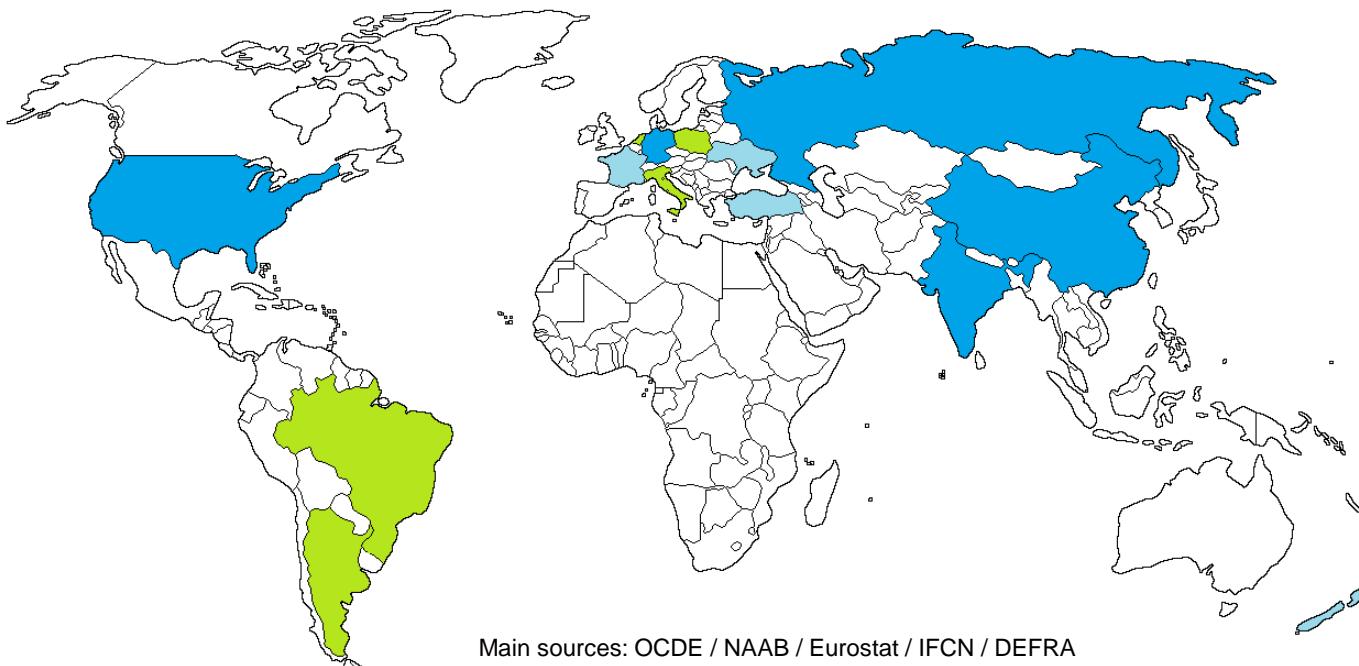
# IntelliGen History

- Pepsi Way opened in April 2015
- Launched brand in October 2017 during World Dairy Expo
- Today – over 280+ employees across 4 continents
- 11 Operating laboratories across the Globe
- Over 20 million units produced (Feb 2022 since launch of Sexcel)



# Dairy AI Potential

Top 15 countries based on AI unit potential



# Global sexed genetics market volume growth (est.) ( 10% YOY CAGR)



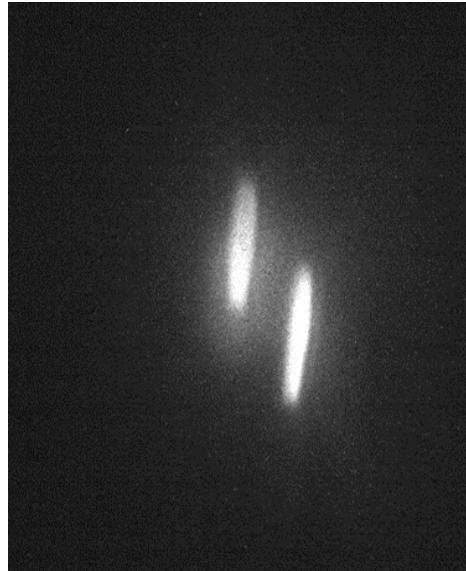
# Intelligen®: The Process

## SEPARATING X & Y



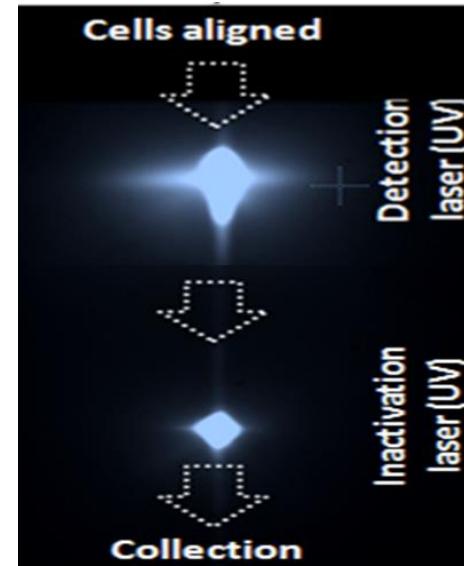
Stained cells with X chromosome glow brighter due to 3.8% more DNA content.

## CELL ALIGNMENT



The microfluidic flow cell orients and aligns the cells.

## DESIRED SEX SKEW

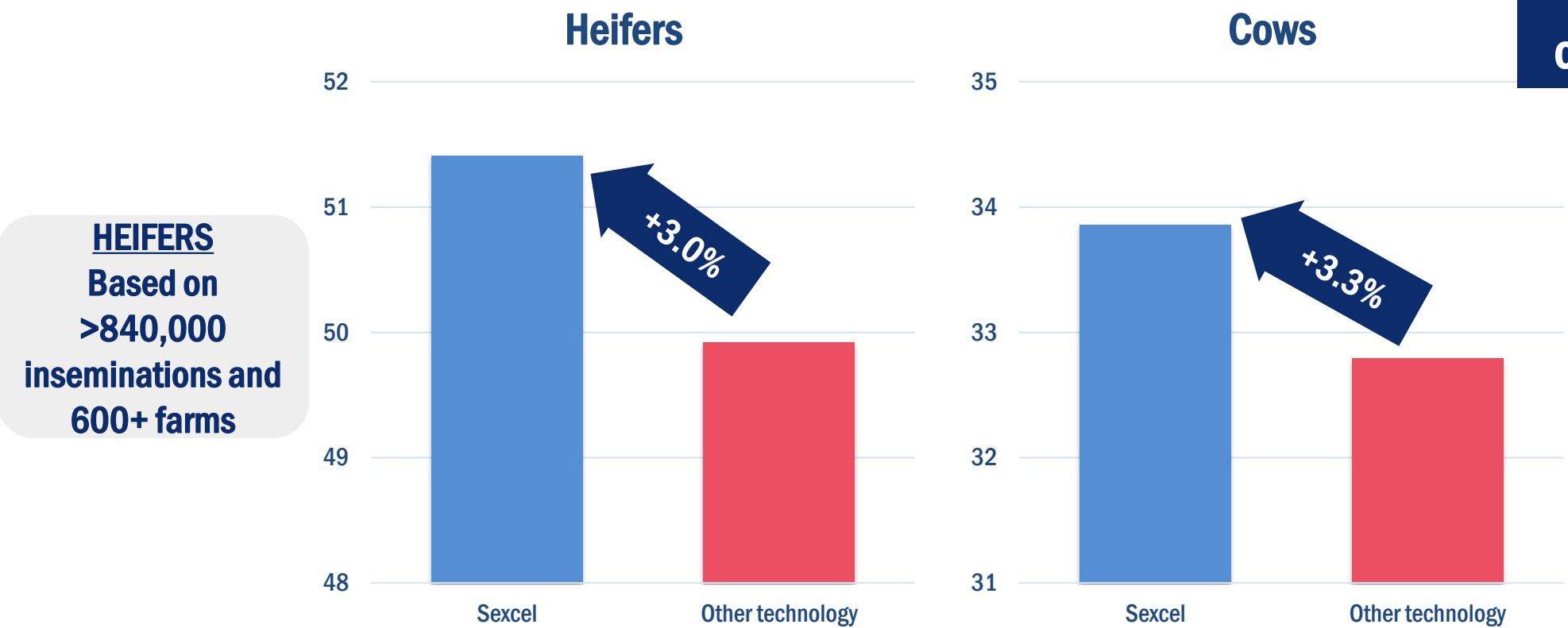


Inactivation laser deactivates unwanted cells

# Sexcel® Real-World-Data – Holstein



“Better fertility on cows and heifers”



**HEIFERS**  
Based on  
>840,000  
inseminations and  
600+ farms

**COWS**  
Based on  
>280,000  
inseminations and  
450+ farms

1.64 MILLION inseminations (all breeds)

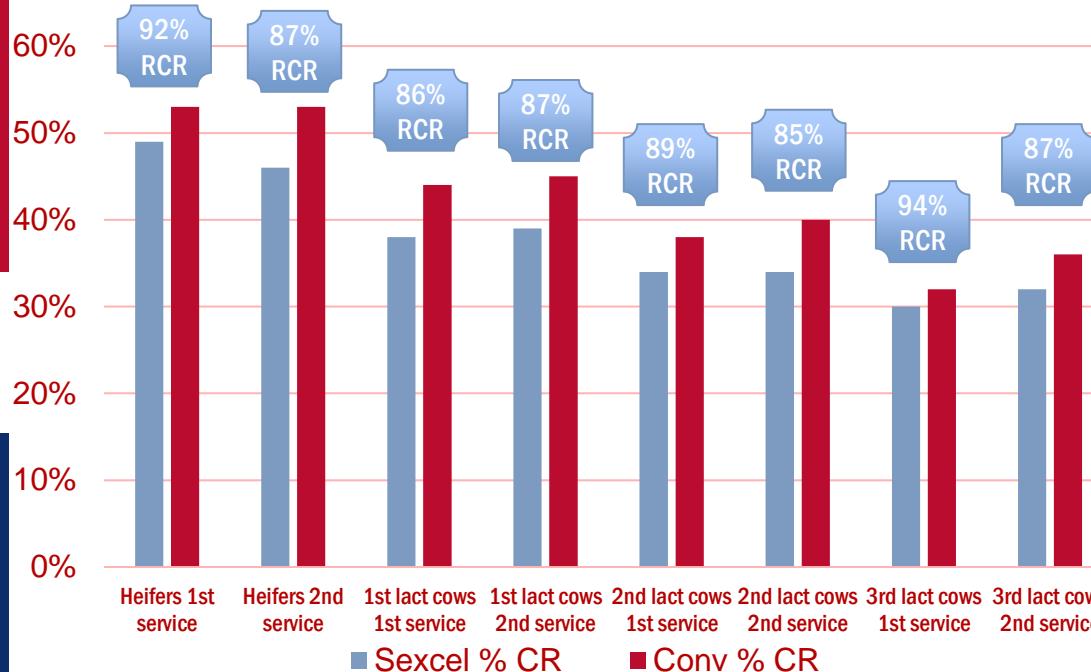
# Sexcel® RMS PERFORMANCE - UK

## 169,693 Inseminations

### IMPROVED PERFORMANCE ON COWS

RCR as high as **94%**  
3<sup>rd</sup> lactation cows!

**SWING TO SEXCEL®**  
88% services went to  
Sexcel® in maiden heifers



### BETTER RELATIVE CONCEPTION RATE

**92%** Relative conception rate  
on maiden heifers.

>31,000 Pregnancies created  
from Sexcel® last year

### Doing great things for customers!

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# What should be expected in the field?

Conception rate by service number in heifers

Bred Number	95% CI	%Conc	#Preg	#Open	Other	Abort	Total	%Tot	SPC
1	62-66	64	1604	912	0	93	2516	57	1.6
2	57-63	60	602	403	1	32	1006	23	1.7
3	45-54	50	223	227	1	16	451	10	2.0
4	45-57	51	126	121	0	11	247	6	2.0
5	35-53	44	46	59	0	4	105	2	2.3
6	36-61	48	29	31	1	4	61	1	2.1
7	19-52	33	9	18	0	0	27	1	3.0
8	-	33	3	6	0	0	9	0	3.0
OTHERS	-	22	4	14	0	1	18	0	4.5
TOTALS	58-61	60	2646	1791	3	161	4440	100	1.7

What is the conception rate by lactation number?

LGRP	95% CI	%Conc	#Preg	#Open	Other	Abort	Total	%Tot	SPC
1	42-47	44	680	863	51	41	1594	36	2.3
2	30-36	33	379	767	70	28	1216	27	3.0
3	29-33	31	468	1043	121	42	1632	37	3.2
TOTALS	35-38	36	1527	2673	242	111	4442	100	2.8

1st AI

92% RCR

58.9%

2nd AI

87% RCR

52.2%

CR 1st Lact

87% RCR

37.8%

# Why should Sexcel® be used?

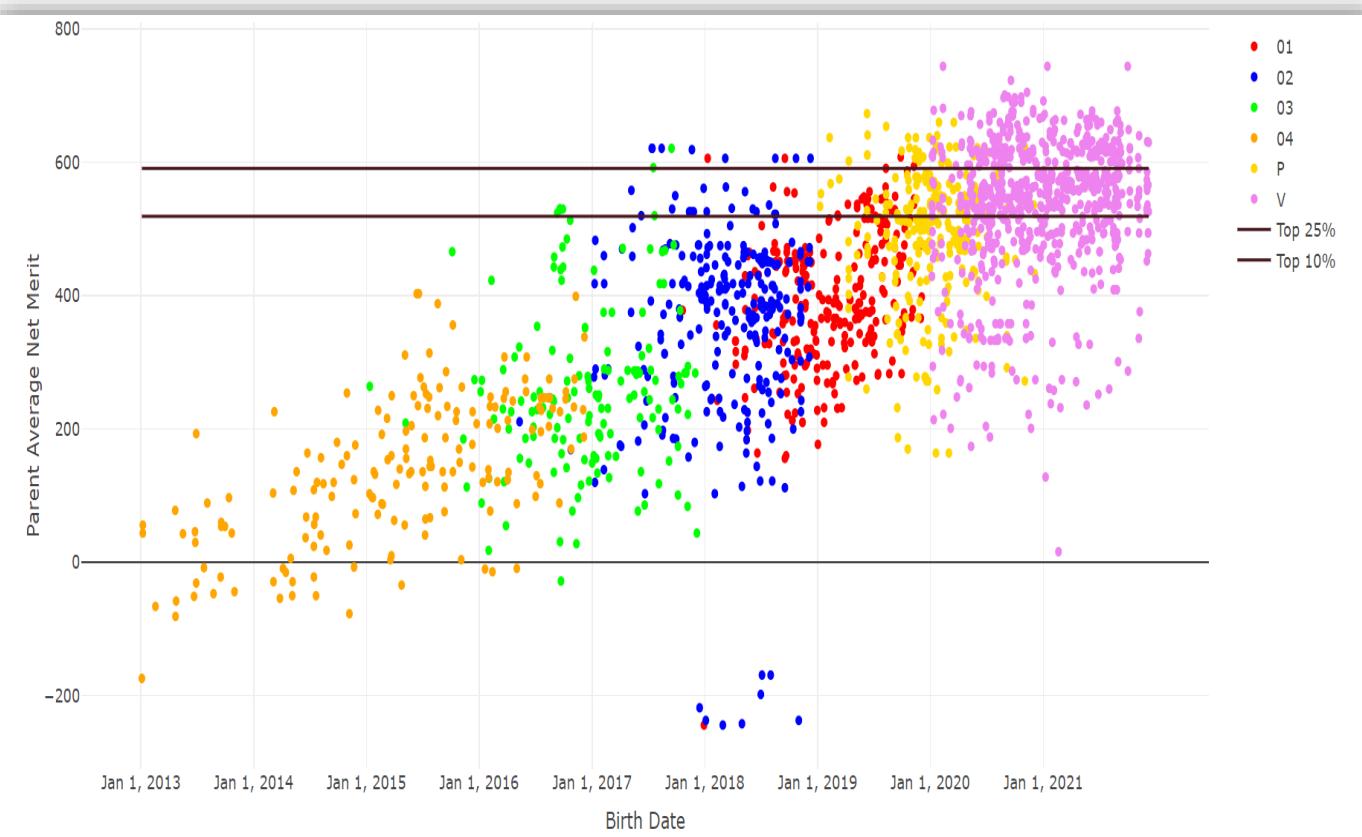
Faster genetic progress

Extra revenue from beef calves

Less issues at calving

Better management of the replacement rate

# Adult cows versus younger generations



"I want a female calf from my best cow"



Gateway PTA Milk 1650 lbs



12-month old heifers with PTA Milk 1376



Favourite cow PTA Milk 504

Example from March 2021

# Sire PTA Information

# Cows	NM\$	Milk	Fat	Prot	DPR	PL	SCS	BSC	FLC	UDC	TPI
4th lact+	145	56	201	7	5	-0,1	0,1	2,96	0,35	0,55	0,2
3rd Lact	135	248	481	21	1	0,9	2,4	2,84	0,3	0,1	0,28
2nd Lact	180	376	972	39	36	0,3	3	2,86	0,54	0,34	0,5
1st Lact	245	442	1112	49	38	0,3	3,1	2,9	-0,1	0,3	0,69
Yearlings	419	502	1007	48	42	0,8	3,9	2,91	-0,25	0,15	1,12
Calves	456	654	1265	75	49	-0,1	4,6	2,83	-0,17	0,23	1,05
Current Pregnancies	738	728	1284	85	53	0	5	2,85	-0,15	0,25	1,2
											2820

Yearlings would produce around 300 Kg more than adult cows



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<https://doi.org/10.3168/jds.2021-20354>

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**Growth, milk production, reproductive performance, and stayability of dairy heifers born from 2-year-old or mixed-age dams**

R. C. Handcock,<sup>1\*</sup> N. Lopez-Villalobos,<sup>1</sup> P. J. Back,<sup>1</sup> R. E. Hickson,<sup>1</sup> and L. R. McNaughton<sup>2</sup>

<sup>1</sup>School of Agriculture and Environment, Massey University, Private Bag 11-222, Palmerston North 4442, New Zealand

<sup>2</sup>Livestock Improvement Corporation, Private Bag 3016, Hamilton 3240, New Zealand

# Sexcel® versus Conventional

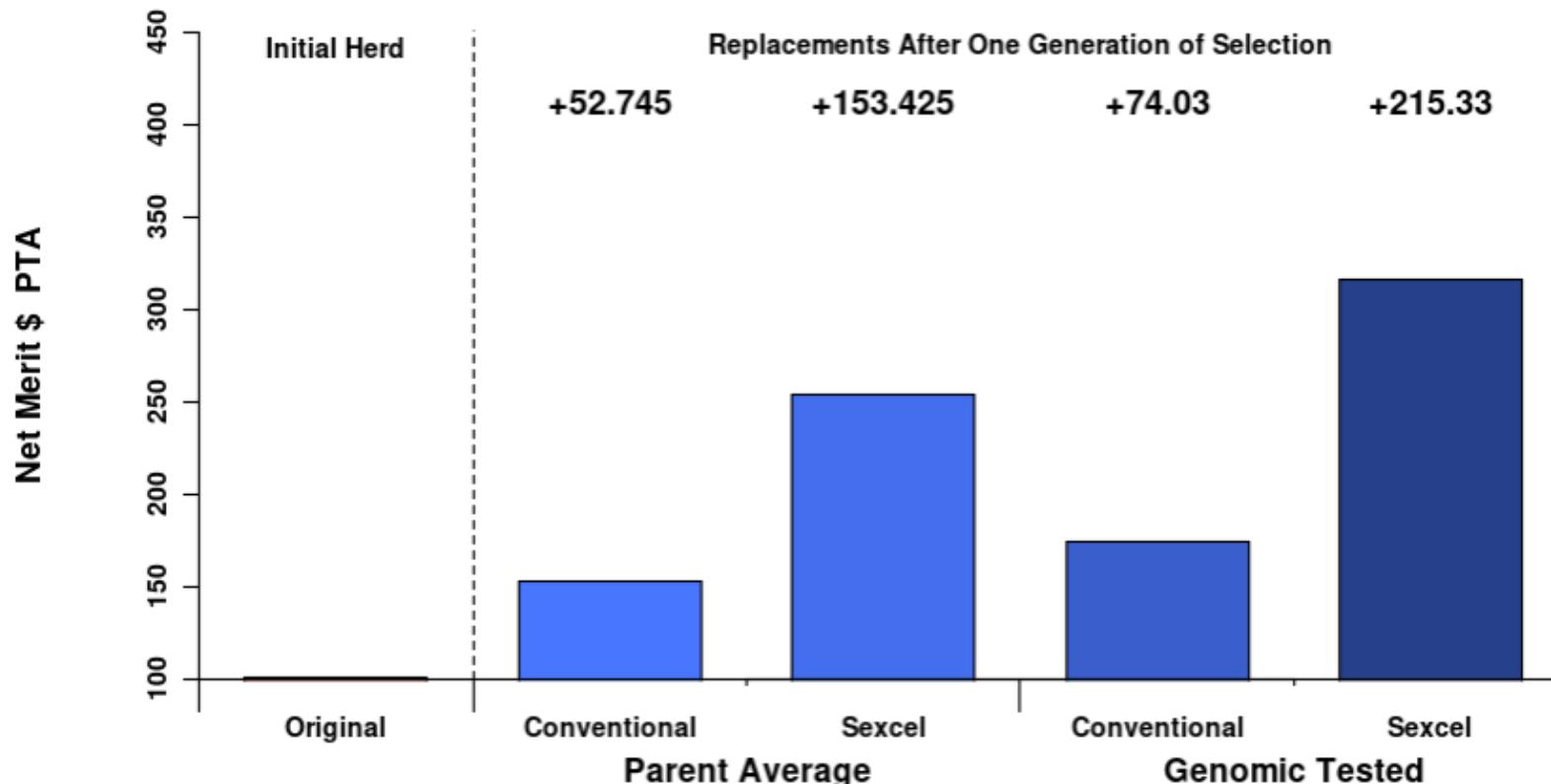


Plan your Genetic "Step-Change"  
With Genus



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\*Genetic variation for is approximated from a three generation sire stack.  
Conventional selection intensity of top 85%. For Sexcel the top 50% used for the same number of Heifers. All cows served to conception.

# Stillbirth and dystocia: benefits of sexed semen use

- Seidel (2003) and Weigel (2004) expected to reduce the incidence of dystocia, especially for nulliparous heifers due to the calf size.
- Borchersen and Peacock (2009) reported stillbirth rates of 10% and 12% for female calves (sexed and conventional semen, respectively), 14% and 20% for male calves (sexed and conventional semen, respectively).



J. Dairy Sci. 93:3880–3890  
doi:10.3168/jds.2009-2781

© American Dairy Science Association®, 2010.

## Use of sexed semen and its effect on conception rate, calf sex, dystocia, and stillbirth of Holsteins in the United States

H. D. Norman,<sup>1</sup> J. L. Hutchison, and R. H. Miller

Animal Improvement Programs Laboratory, Agricultural Research Service, USDA, Beltsville, MD 20705-2350

Trait	Calf birth status	Heifer breedings, %		Cow breedings, %	
		Conventional	Sexed	Conventional	Sexed
Dystocia	Single female	3.8 <sup>a</sup>	3.8 <sup>a</sup>	1.8 <sup>a</sup>	0.9 <sup>a</sup>
	Single male	8.0 <sup>b</sup>	8.8 <sup>b</sup>	3.3 <sup>b</sup>	1.2 <sup>b</sup>
	Twins	6.5 <sup>c</sup>	4.4 <sup>c</sup>	4.7 <sup>c</sup>	1.3 <sup>b</sup>
Stillbirth	All births	6.0	4.3	2.5	0.9
	Single female	9.7 <sup>a</sup>	10.8 <sup>a</sup>	3.6 <sup>a</sup>	2.7 <sup>a</sup>
	Single male	10.8 <sup>b</sup>	15.6 <sup>b</sup>	3.6 <sup>a</sup>	2.6 <sup>a</sup>
	Twins	12.5 <sup>c</sup>	10.4 <sup>c</sup>	7.5 <sup>b</sup>	5.8 <sup>b</sup>
	All births	10.4	11.3	3.6	2.7

<sup>a–c</sup>Percentages within a column with different superscripts differ ( $P < 0.05$ ).

# Better management of the replacement rate



Animal  
Volume 11, Issue 8, 2017, Pages 1372-1380



An empirical analysis of the cost of rearing dairy heifers from birth to first calving and the time taken to repay these costs

A.C. Boulton , J. Rushton , D.C. Wathes

 J. Dairy Sci. 103:3828–3837  
<https://doi.org/10.3168/jds.2019-17143>  
© American Dairy Science Association®, 2020.

**Symposium review: An abundance of replacement heifers: What is the economic impact of raising more than are needed?\***

M. W. Overton and K. C. Dhuyvetter  
Elanco Animal Health, Greenfield, IN 46140

**TABLE 1** Quarterly average replacement dairy cow prices, major dairy states (\$ per head)

State	January 2021	October 2021	January 2022	Change from previous quarter	Change from previous year
Arizona	1,500	1,500	1,500	0	0
California	1,350	1,300	1,330	30	-20
Colorado	1,300	1,400	1,400	0	100
Florida	1,400	1,430	1,460	30	60
Georgia	1,280	1,290	1,250	-40	-30
Idaho	1,350	1,300	1,350	50	0
Illinois	1,290	1,320	1,300	-20	10
Indiana	1,350	1,320	1,370	50	20
Iowa	1,310	1,310	1,380	70	70
Kansas	1,400	1,380	1,450	70	50
Michigan	1,400	1,360	1,410	50	10
Minnesota	1,260	1,260	1,320	60	60
New Mexico	1,400	1,450	1,400	-50	0
New York	1,300	1,270	1,330	60	30
Ohio	1,230	1,300	1,310	10	80
Oregon	1,300	1,250	1,400	150	100
Pennsylvania	1,250	1,310	1,400	90	150
South Dakota	1,350	1,330	1,350	20	0
Texas	1,400	1,350	1,400	50	0
Utah	1,200	1,250	1,200	-50	0
Vermont	1,350	1,400	1,460	60	110
Virginia	1,180	1,260	1,300	40	120
Washington	1,350	1,350	1,400	50	50
Wisconsin	1,470	1,450	1,470	20	0
U.S.	1,360	1,340	1,380	40	20

Source: USDA NASS Ag Prices Report, Jan 31 2022

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# Better management of the replacement rate

Current Strategy: only conventional  
Future Strategy: Sexcel®&beef/Conventional

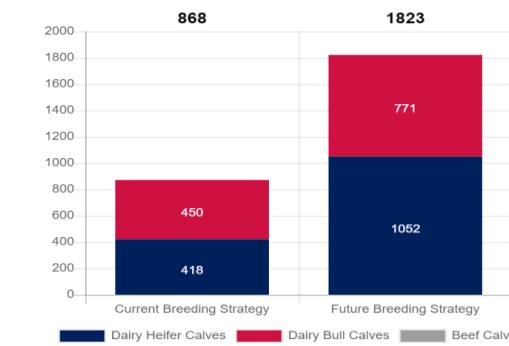
Heifers: 1<sup>st</sup> and 2<sup>nd</sup> AI Sexcel®

Fertility in heifers:  
• 60% Conventional  
• 50% Sexcel®

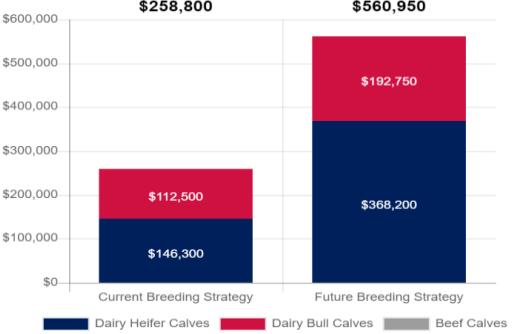
Calf Value (1 month old)  
• Holstein bulls:250  
• Holstein Heifers:350  
• Beef calves:320

## ▼ Calf Crop Projections

Annual Live Calf Crop Summary

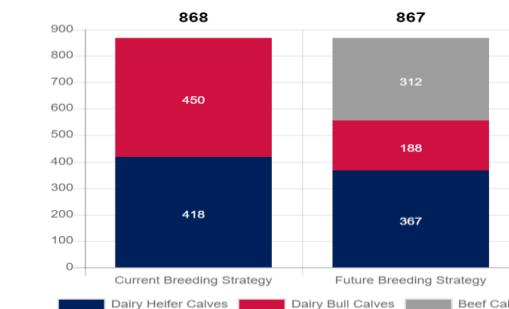


Calf Crop Value



## ▼ Calf Crop Projections

Annual Live Calf Crop Summary



Calf Crop Value



# Take home messages about Sexcel®

- Continuous growth year after year.
- Great improvement on sexed semen fertility.
- Great opportunity for genetic improvement.
- Less problems at calving : better transition periods.
- Maximize profit by using more beef or raising extra heifers for sale.

Many thanks!



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