
SEMEX
EastGen
The Next Semex Solution
Elevate™

What are the benefits of female genomics?

Advanced Herd Strategies & More Accurate Decisions

Decisions would have made <u>without genomics</u>

vs.

Decisions made <u>with genomics</u>

$$\text{RESPONSE} = \frac{\text{ACCURACY} \times \text{SELECTION INTENSITY} \times \text{DIVERSITY}}{\text{TIME}}$$

ACCURACY: Daughters, Data or GENOMICS

SELECTION INTENSITY: Create next generation using only the best

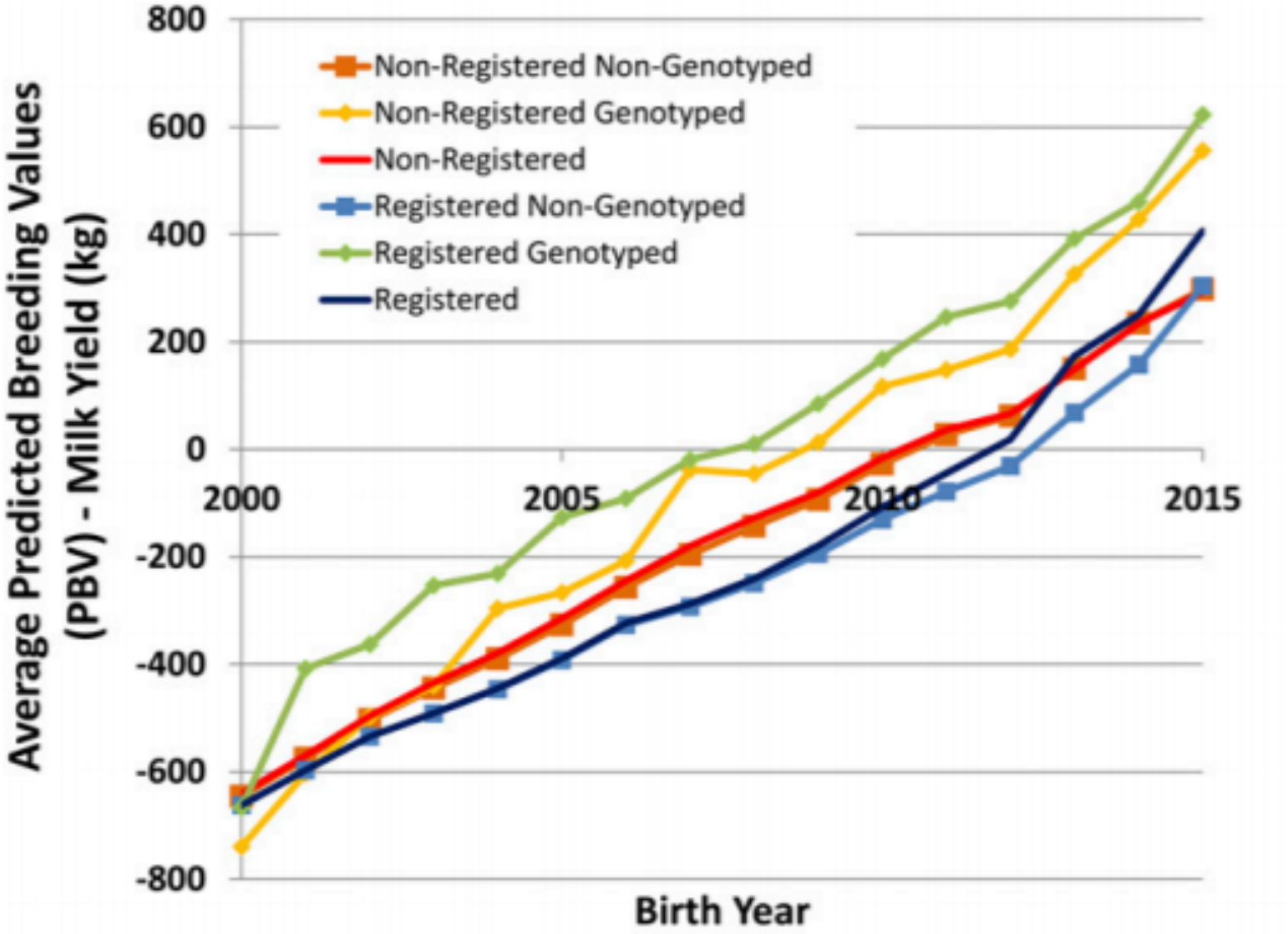
DIVERSITY: Difference between best animals in herd and the rest

TIME: Reduced Average age of animals bred

Time

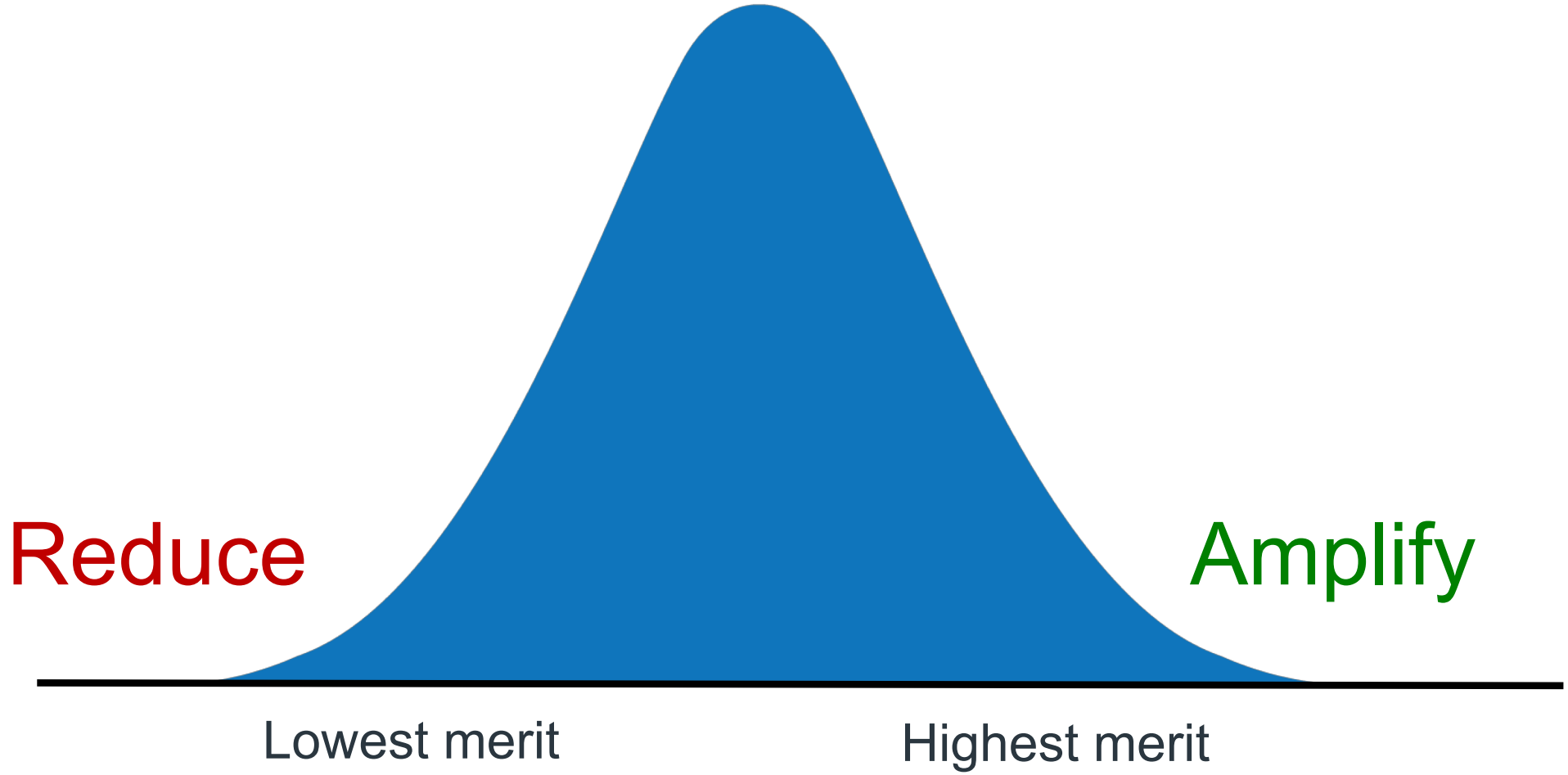
- Generation interval is shorter under genomics from the sire side, more genomic sire usage speeds up genetic progress
- We create a shorter generation interval also by using advanced reproductive techniques (IVF etc.)
- But what about the commercial female side?

Time


Average Predicted Breeding Values (PBV) - Milk Yield (kg)
800
600
400
200
0
-200
-400
-600
-800
2000
2005
2010
2015
Birth Year
Non-Registered Non-Genotyped
Non-Registered Genotyped
Non-Registered
Registered Non-Genotyped
Registered Genotyped
Registered

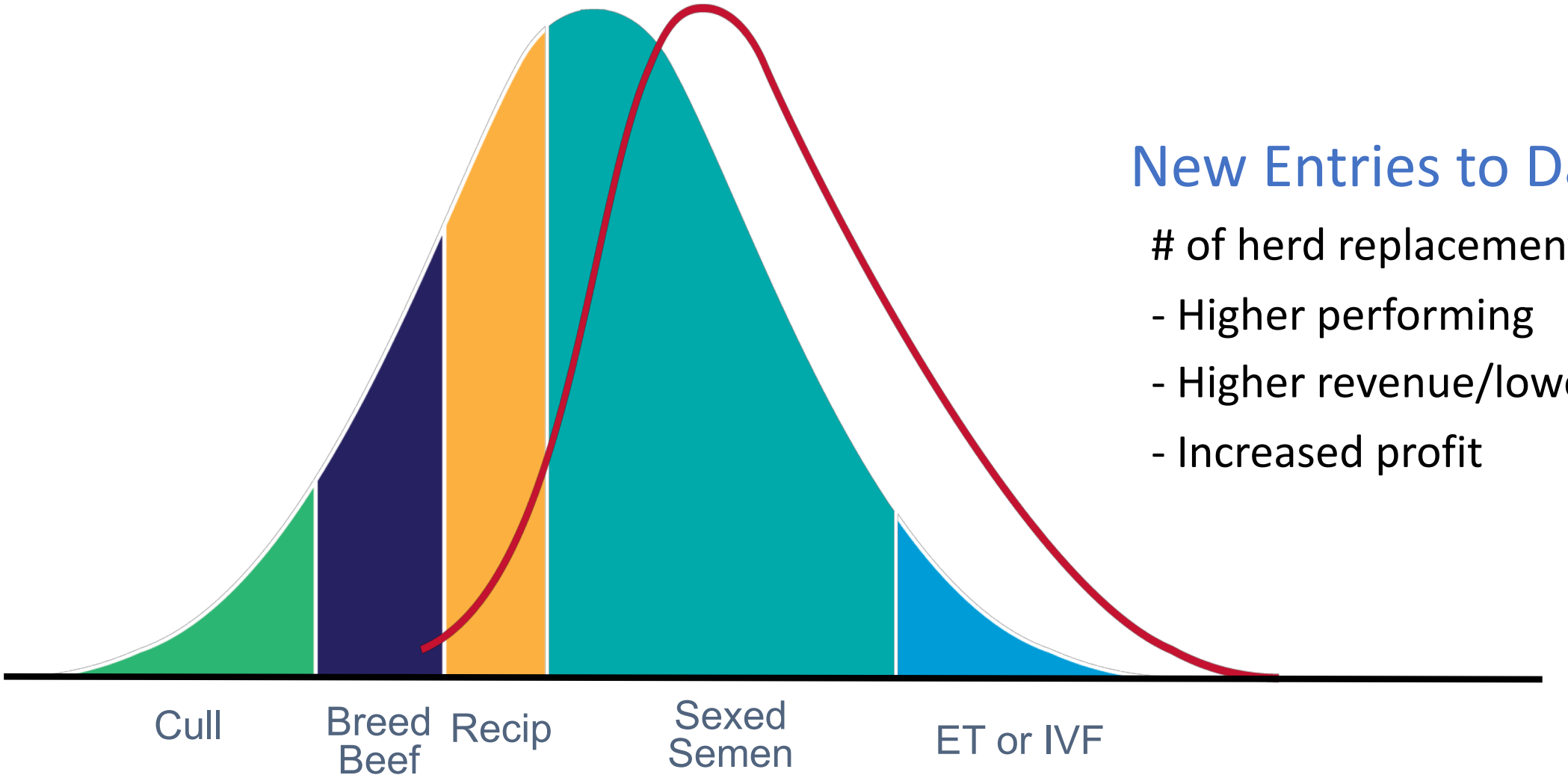
Time

- Genomics allows us to identify elite animals, which are far more often younger than herd average
- Age of females that are contributing more to next generation is younger, therefore generation intervals are shorter
- Sexed semen plays a major role in this shift


Reduce
Amplify
Lowest merit
Highest merit

Selection Intensity

- The difference between the average of animals selected to breed the next generation compared to whole herd average
- Culling: Culling the bottom 20% of a herd can increase the average NM$ of the selected group by nearly $100.
- Beef: Using beef on the bottom end can do the same
- Sexed: Sexed semen on the top end ensures heifers from the best genetics – means increased selection intensity



New Entries to Dairy

of herd replacements

- Higher performing
- Higher revenue/lower cost
- Increased profit

$$\text{Response} = \frac{\text{Accuracy} * \text{Selection Intensity} * \text{Diversity}}{\text{Time}}$$

Before Genomics

- Accuracy – PA averages ~35%
- Selection intensity – Low heifer culling rates, low sexed semen usage
- Time – Generation interval is average of age of all animals in herd

With Genomics

- Accuracy ~65%
- Selection intensity – More sexed semen, more heifer culling, more genetic culls in cows
- Time – Gen interval shorter due to increased selection of heifers to produce next generation

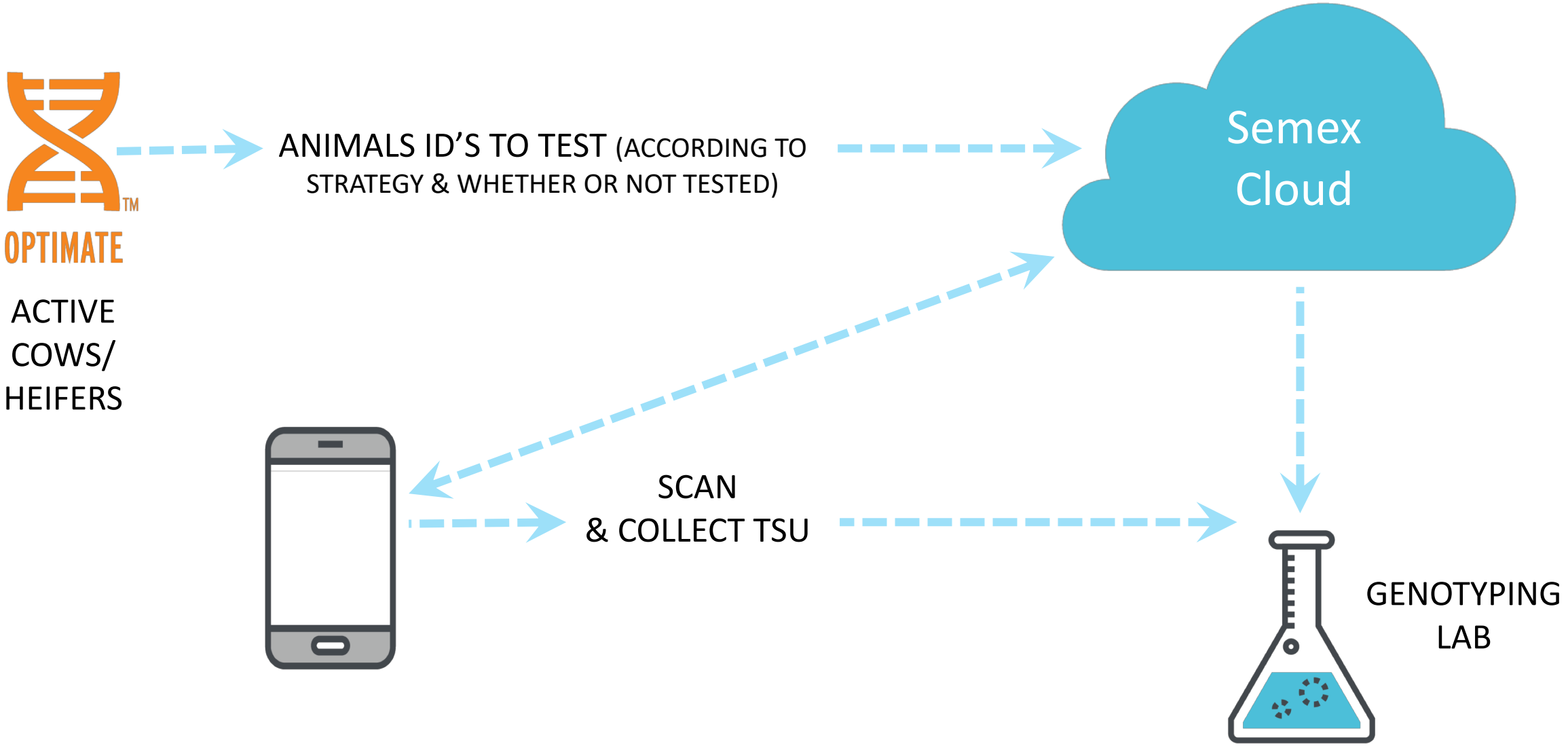
Determining the Selection Strategy that's Best for Each Client

Herd Strategy Analysis

- Use real farm data
  - Repro and cull rates, on farm costs, etc.

- Determine best ratios of sexed semen, IVF/ET, conventional semen, beef semen, culling. (Ensuring adequate replacements for your herd growth goals)
- Adjust these based on what is practical and fits your dairy
- Recommend genotyping only the animals that make sense
  - If you are using genotyping as a culling tool, you don’t need to genotype your highest parent average heifers!

Efficient Sample Collection



Semex Cloud

Elevate

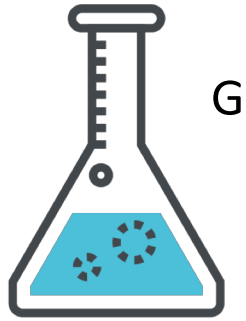
ANIMALS TO SAMPLE

1234
1235
1237
1240
1241
1245
1247
1249
1250
1251

Elevate

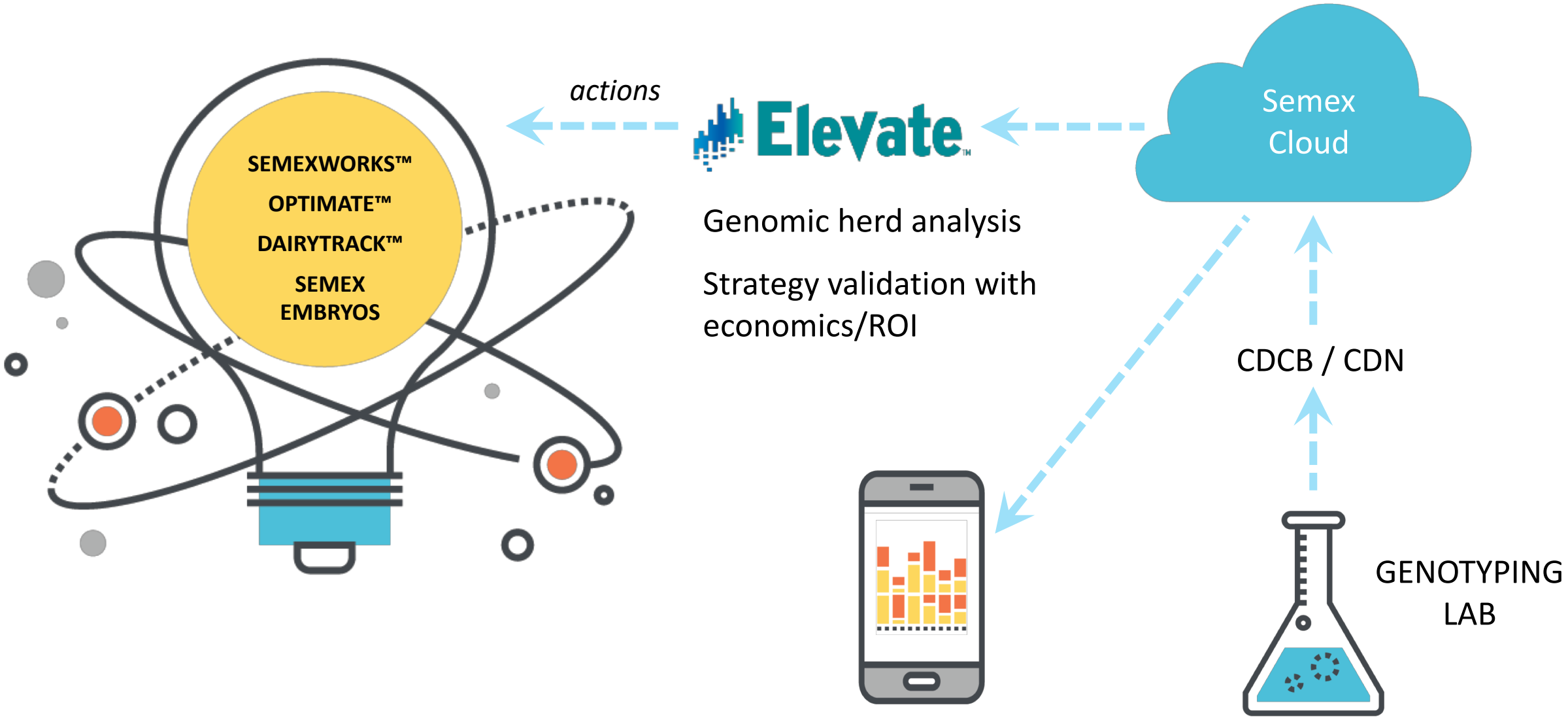
Barn # 1234
Reg # HO840F300345276
Birth 21JUL2017

Barcode NE00326902



GENOTYPING LAB

Results – Decisions



SEMEX

Semex Cloud

Genomic results deployed in highest profit strategy

Seamless sample collection

Low cost genomic testing

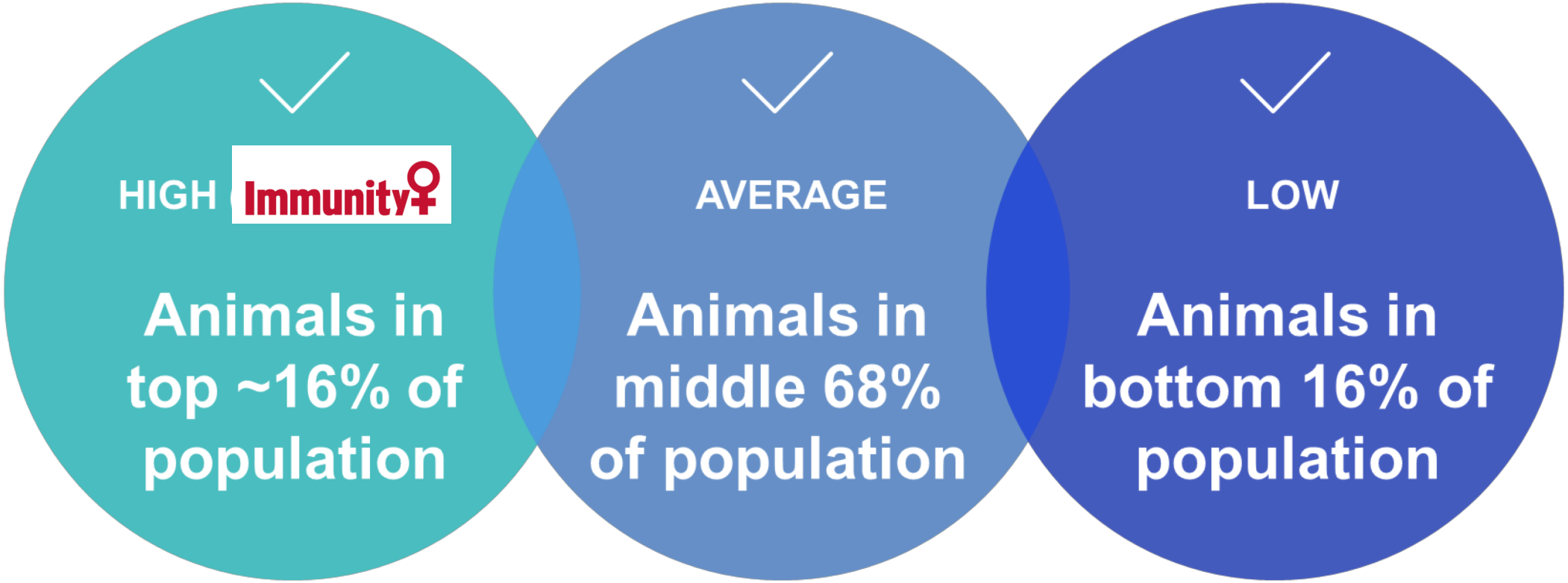
Cows & Heifers

Elevate™

Elevate Genomic Test

- LD chip
- TSU submissions
- Canada, US (with CDCB fee)
- Immunity♀ Genomics
- Best in Industry – Herd analysis & economic strategies
- <30 calendar days to receive results
- A2A2 for small added fee

What You Will See



Immune Genomics Validation

- Gathered genotypes and health records from 22 large US dairies
- Calculated disease incidence after adjusting for age and lactation effects of all genotyped animals (N=9,500)
- Used this information to determine how to display Immune Genomics values
- Significant differences ($p<0.05$) found for lameness, mastitis, persistent mastitis and overall disease frequency

Disease Reduction

Immune Response	ABORT	ILLMISC	KETOSIS	LAME	MAST	METR	MF	PNEU	Mortality (Expected)	**Grand Total**
Immunity♀	6.17%	1.58%	6.77%	8.74%	5.96%	11.00%	0.28%	1.00%	4.83%	**18.58%**
Average	5.89%	1.23%	7.35%	13.85%	6.82%	12.00%	0.15%	1.13%	5.91%	**25.76%**
Low	6.93%	1.88%	7.20%	12.23%	8.29%	12.94%	0.25%	1.21%	6.00%	**26.16%**
	-12.37%	-18.61%	-6.33%	-39.96%	-39.18%	-17.61%	12.33%	-20.99%	-24.23%	**-40.79%**

High Immune females have 41% less disease

Immunity♀

Ticking the Boxes

- ☑ Seamless sample collection via phone app
- ☑ No data entry on farm
- ☑ Fast turnaround time

- ☑ Genomics automatically applied in strategic decisions/mating
- ☑ Phone app with results & other solutions
- ☑ Economics, ROI, validation of strategy & genomic testing

- ☑ Low price
- ☑ Immunity genomics