

IMPROVING HERDS

Using genomics to improve heifer
selection decisions



Herd decisions made easy

- Improving Herds is a demonstration project to accelerate the rate of genetic gain in dairy cows and drive farm business profitability in Australia
- Aiming to turn research into simple, data-driven decisions to deliver profits to farmers

Genomics in Australia

- Genomic breeding values or ABV(g)s available since 2011
- Commercial genotyping taking off
 - Increased by 38% in females over 12 mths
- How much is genotyping worth to farm businesses?

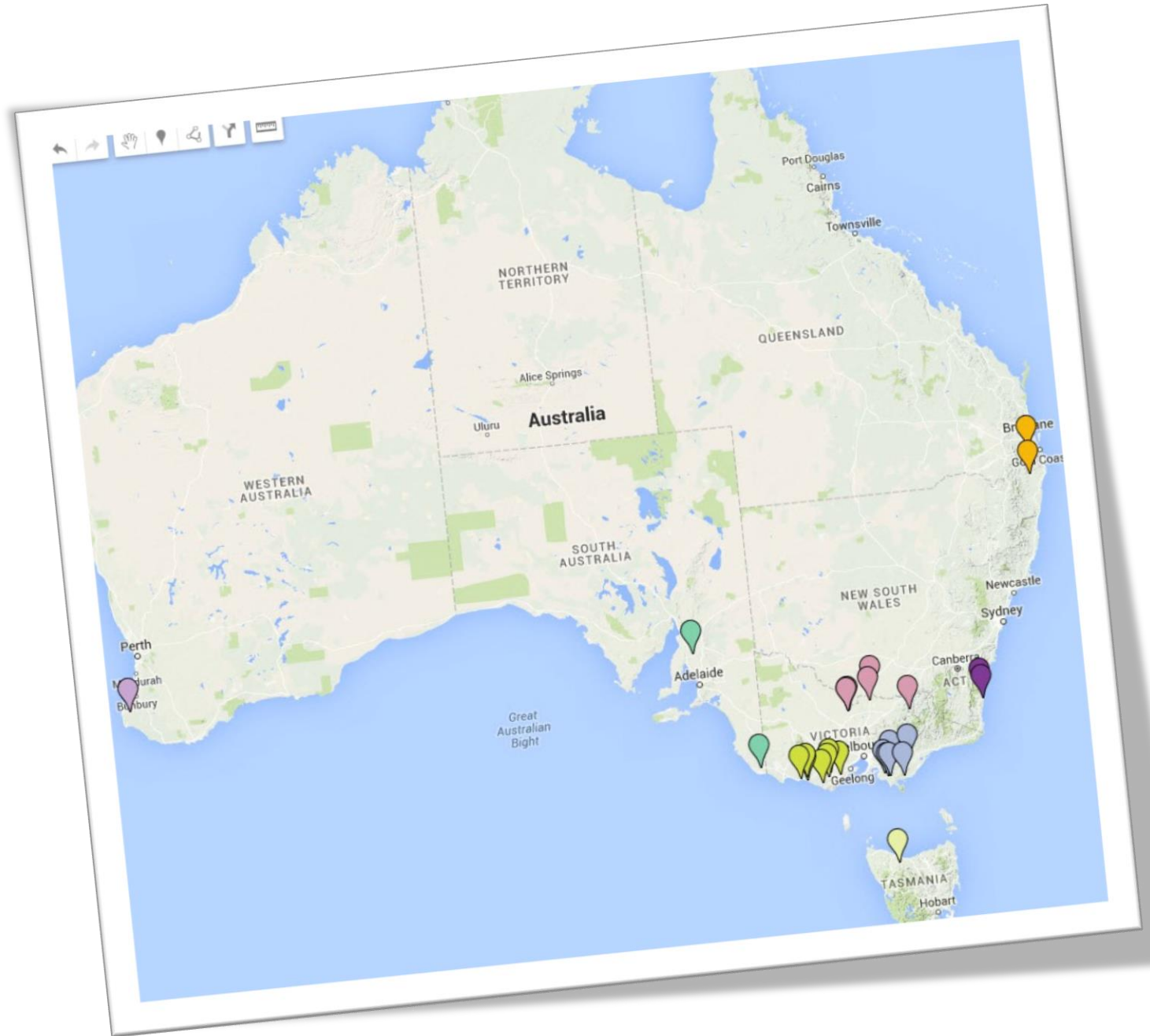
ImProving Herds

- Deterministic model to value genomic testing optimised for pasture-based systems
 - Customisable cost-benefit calculator
 - With and without sexed semen

Newton et al (2018) Journal of Dairy Sci (under review)
- Validation in Genetic Focus farms

Genetic Focus Farms in every region

- 27 Genetic Focus Farms
- Each farm
 - Herd records
 - Financial data
 - Genomic testing of heifers





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2201
21

COLLEEN
2208

1562
2199

1526
2207

Validating genomics

Average reliability of ABVs and ABV(g)s

Trait	Young heifer parent average ABV	Genotyped young heifer ABV(g)	7 th lactation cow ABV
Protein kg	32	74	77
Overall type	21	54	29
Longevity	23	50	33
Fertility	24	50	38

Source: DataGene 2016

What's the relationship between ABV(g)s and performance?



• Reliability ~ 70%

IMPROVING HERDS

- $R^2(\text{production_phenotypes, ABV(g)s}) \sim 70\%$

Split into 2 groups on genomic BPI

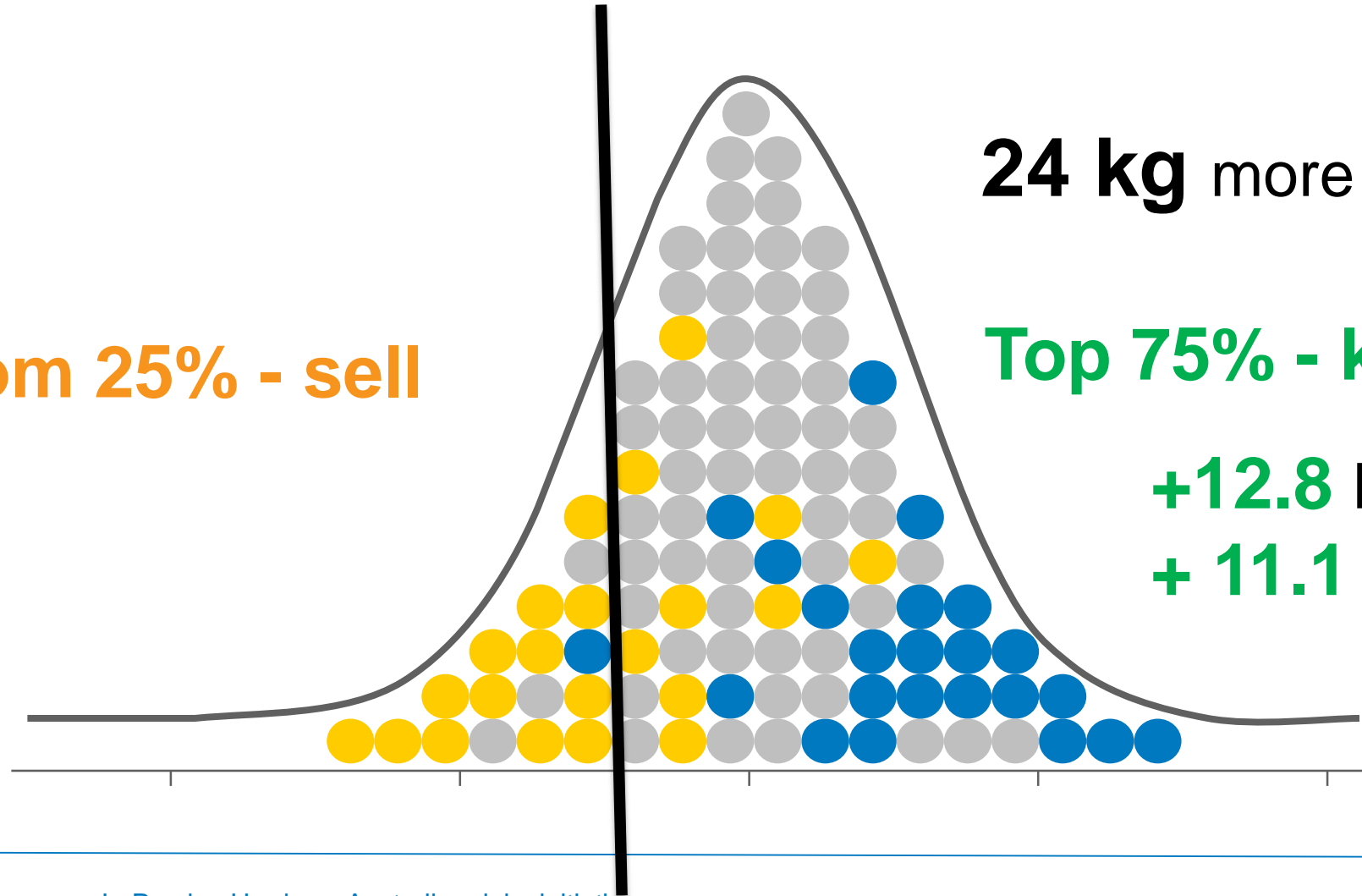
Bottom 25% - sell

24 kg more milk-solids

Top 75% - keep

+12.8 kg fat

+ 11.1 kg protein





75 herd replacements chosen:

Fat: 12.8kg x \$1.79

Protein: 11.1kg x \$6.92

= \$ 7453

\$5,000

to genotype

\$7453-\$5000

=\$2452

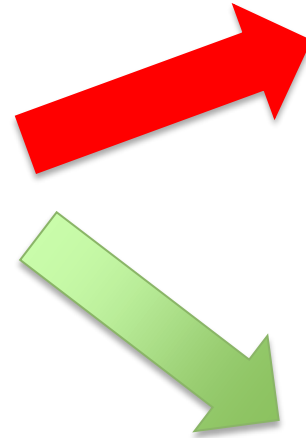
Net benefit (\$33/heifer kept)



100

heifer calves

Use Sire BPI instead



75 herd replacements chosen:

Fat: 4.26 kg x \$1.79

Protein: 1.37 kg x \$6.92

= \$ 1284

~~to genotype~~



100

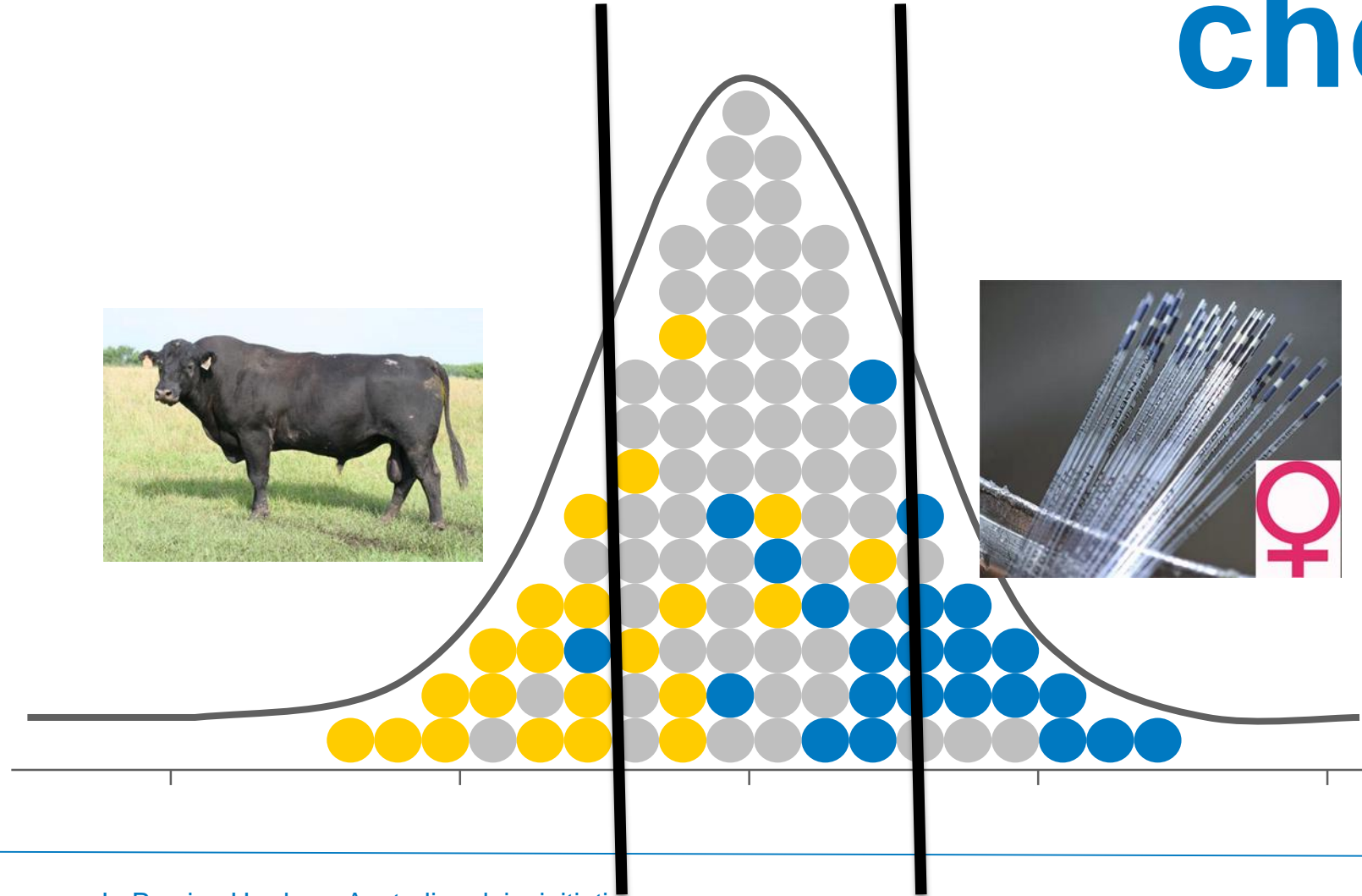
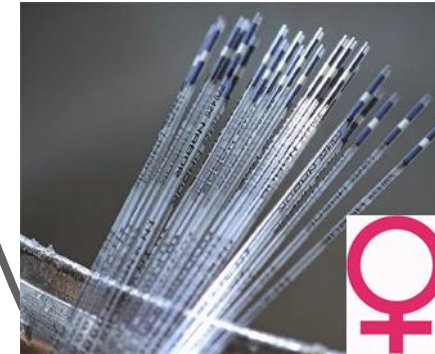
heifer calves

\$2452-\$1284

=\$1168

**Advantage of genotyping
versus using sire EBVs**

Mating choices



Who is your Mum and Dad?



Genomics performed as expected

- ImProving Herds demonstrated that
 - the first lactation performance of cows in 27 herds was consistent with their genomic testing results
 - farmers can make future herd decisions early in a calf's life

ImProving Herds project team

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 DataGene
Solutions for Herd Development


NATIONAL HERD IMPROVEMENT
NHIA
ASSOCIATION OF AUSTRALIA INC.

Special thanks



- Erika Oakes
- Michelle Axford
- Miranda Clark
- Rohan Butler
- Phuong Ho
- Jo Newton
- Ben Hayes





Thank You

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