

IMPROVING HERDS

A photograph of four dairy cows grazing in a lush green field. The cows are of various breeds, including black and white Friesians and a white cow with black spots. The background shows a line of trees and a clear blue sky.

Australia's new dairy breeding indices: are they living up to expectations?

Ben Hayes, John Morton and Jo Newton

Australia's breeding indices

Australia's breeding indices

Balanced Performance Index (BPI)

- Economic index
- Blends production, type and health traits for maximum profit
- In line with farmer preferences



Health Weighted Index (HWI)

- Fast track fertility and mastitis resistance



Type Weighted Index (TWI)

- Fast track type



Australia's breeding indices

Balanced Performance Index (BPI)

- Economic index
- Blends production, type and health traits for maximum profit
- In line with farmer preferences



Health Weighted Index (HWI)

- Fast track fertility and mastitis resistance

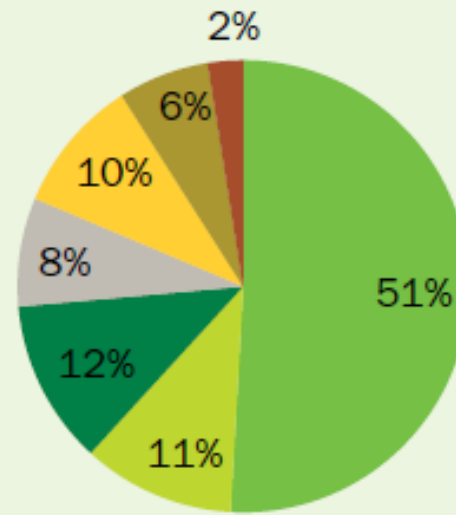


Type Weighted Index (TWI)

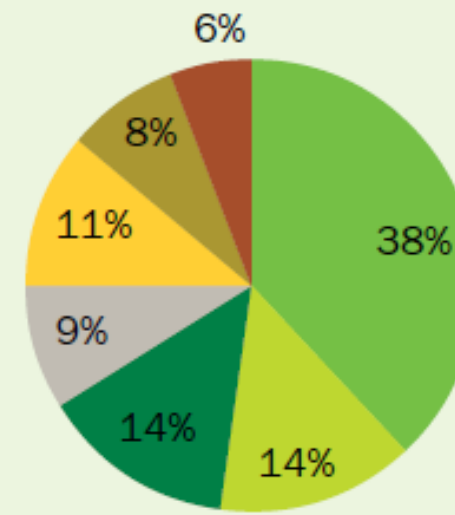
- Fast track type



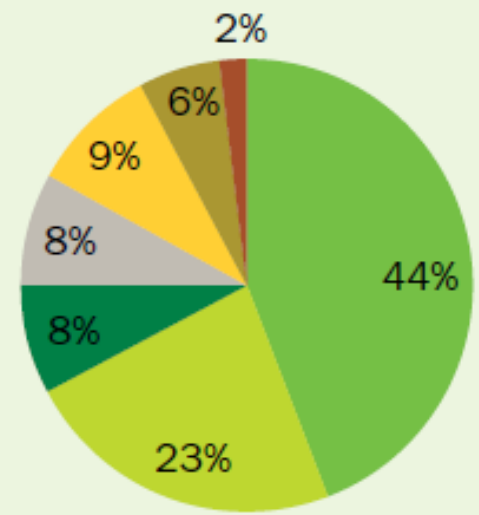
Balanced Performance Index



Health Weighted Index



Type Weighted Index



■ ASI - Production ■ Fertility ■ Cell Count ■ Feed Efficiency ■ Type ■ Survival ■ Workability

Australia's breeding indices

Question 1. What are differences observed on farm between cows sired by high and low index bulls?

Australia's breeding indices

Question 1. What are differences observed on farm between cows sired by high and low index bulls?

Question 2. Do selection indices select bulls with daughters that perform better in all production systems, or in only one or two production systems?

Australia's breeding indices

Question 1. What are differences observed on farm between cows sired by high and low index bulls?

Question 2. Do selection indices select bulls with daughters that perform better in all production systems, or in only one or two production systems?

Question 3. Do cows with higher BPI contribute more to farm profit than cows with low BPI?

Australia's breeding indices

Question 1. What are differences observed on farm between cows sired by high and low index bulls?

Question 2. Do selection indices select bulls with daughters that perform better in all production systems, or in only one or two production systems?

Question 3. Do cows with higher BPI contribute more to farm profit than cows with low BPI?

Feeding the Genes (John Morton)

Aims:

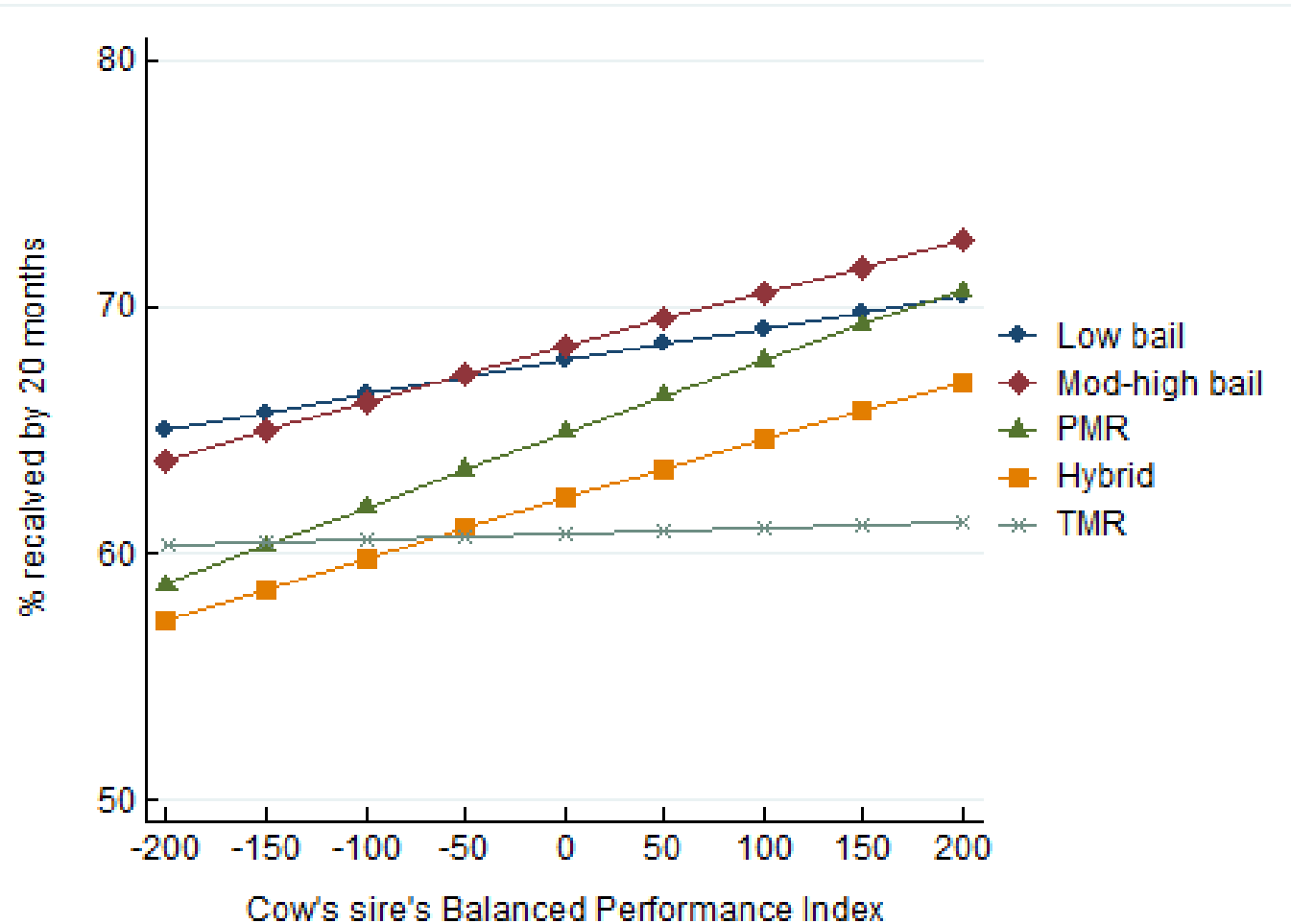
1. Assess differences actually observed on farm between cows from sire's with increasing BPI, HWI and TWI
 - Milk production, survival and reproductive performance of daughters,
2. Compare by feeding system.

Longevity/Survival

- Proportion of cows recalved by 20 months.
- Holsteins: 60,433 lactations, 20,543 cows, 64 herds
- Jerseys: 2,838 lactations, 976 cows, 27 herds.
- Compare BPI/HWI/TWI of sire to proportion recalved by 20 months
- Analysed by feeding system

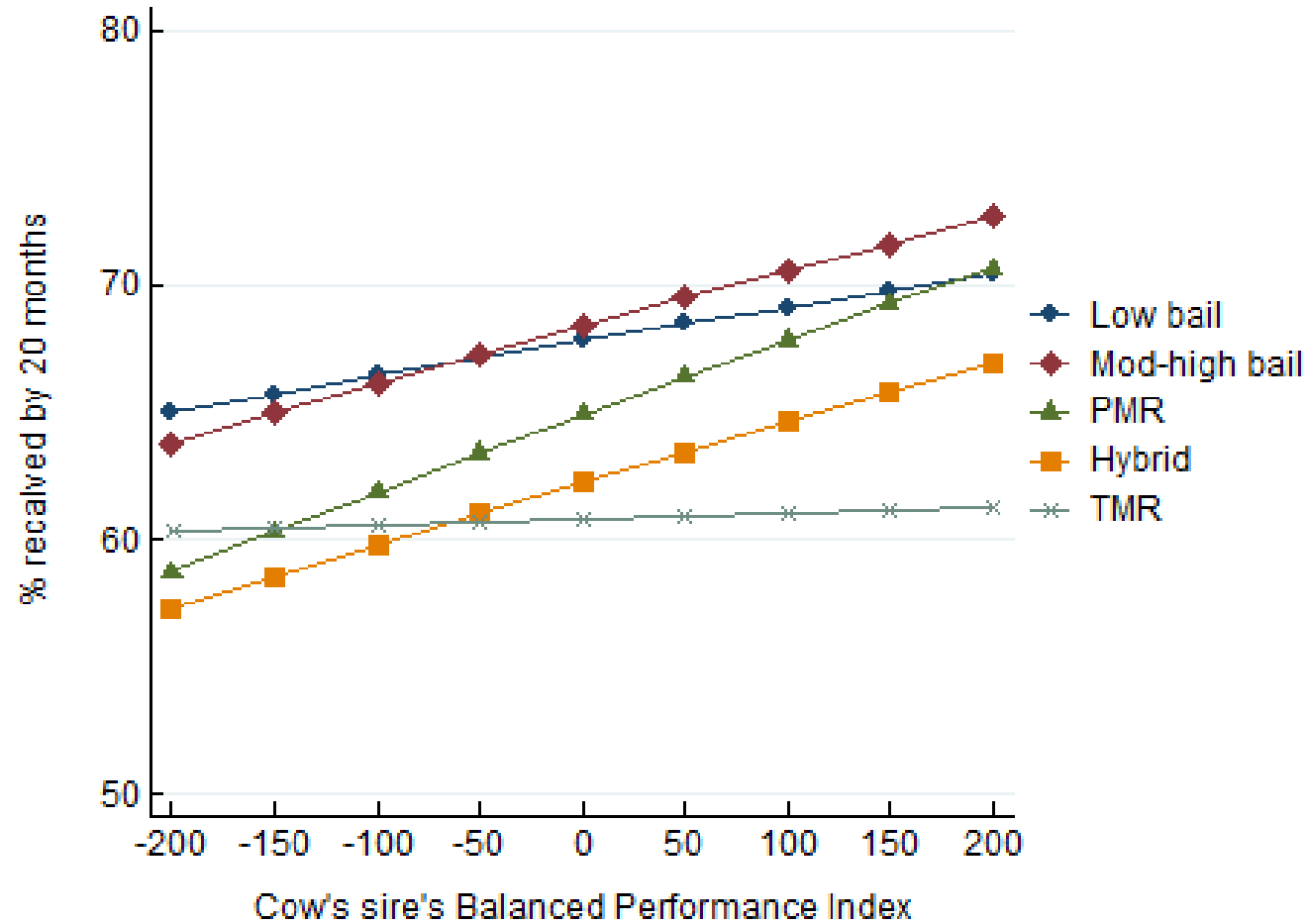
Cow's sired by high BPI sires... were more likely to have recalved by 20 months

Balanced Performance Index

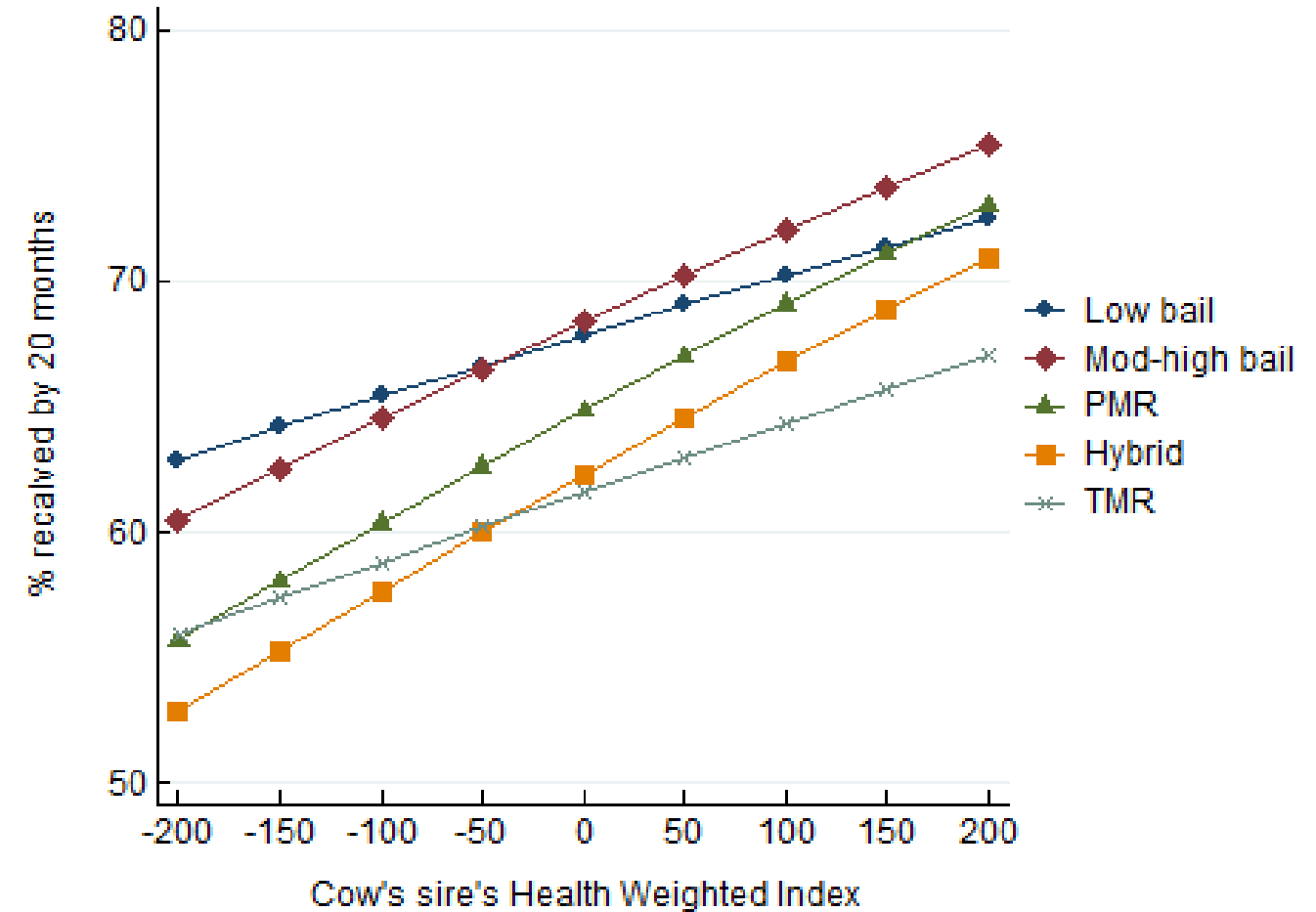


Cow's sired by high BPI sires & high HWI sires... were more likely to have recalved by 20 months

Balanced Performance Index



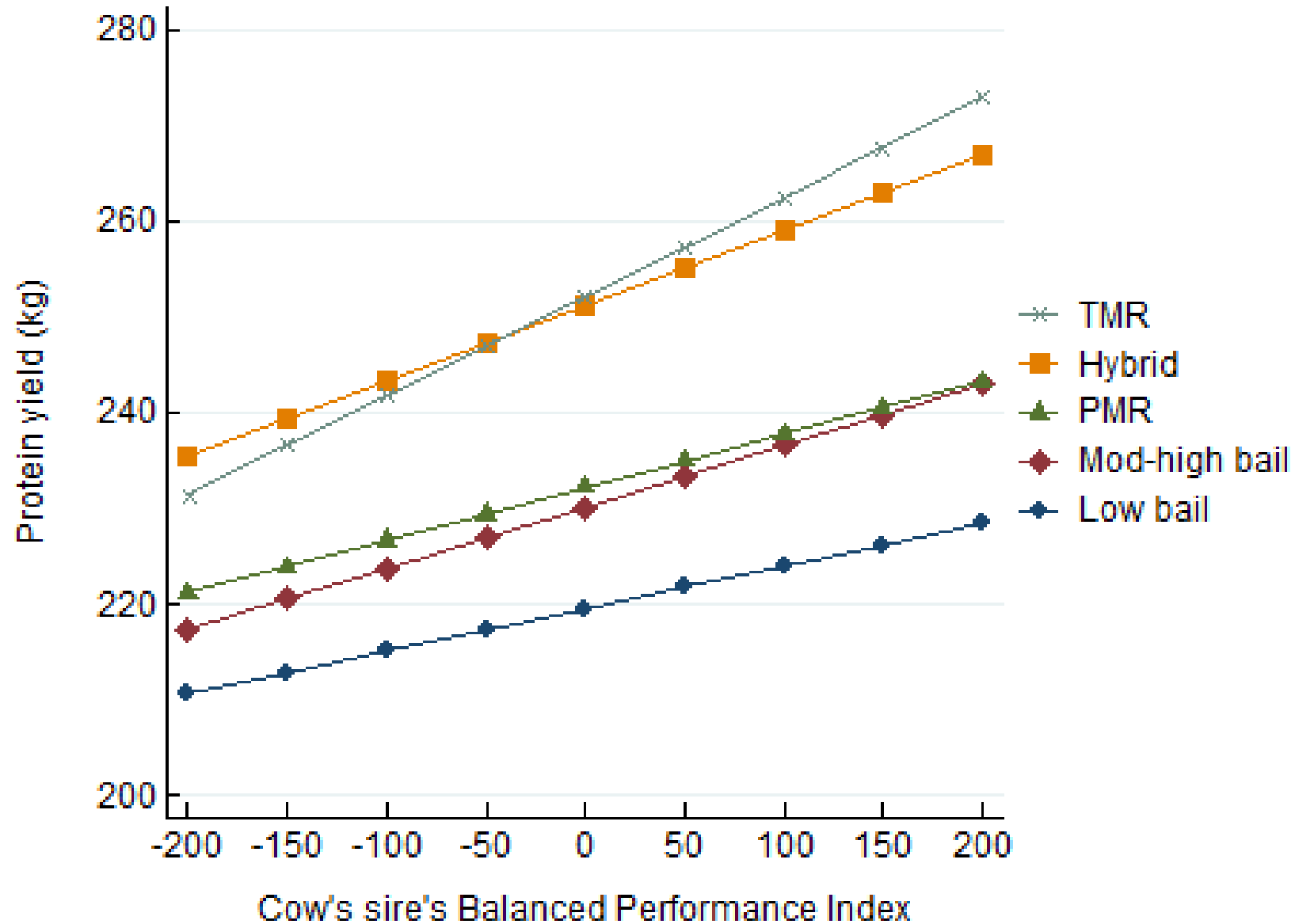
Health Weighted Index



Production

- Analysed by feeding system
- Holsteins: 203,746 lactations, 100,702 cows, 437 herds
- Jerseys: 36,357 lactations, 17,414 cows, 171 herds.
- Compare BPI/HWI/TWI of sire to protein kg

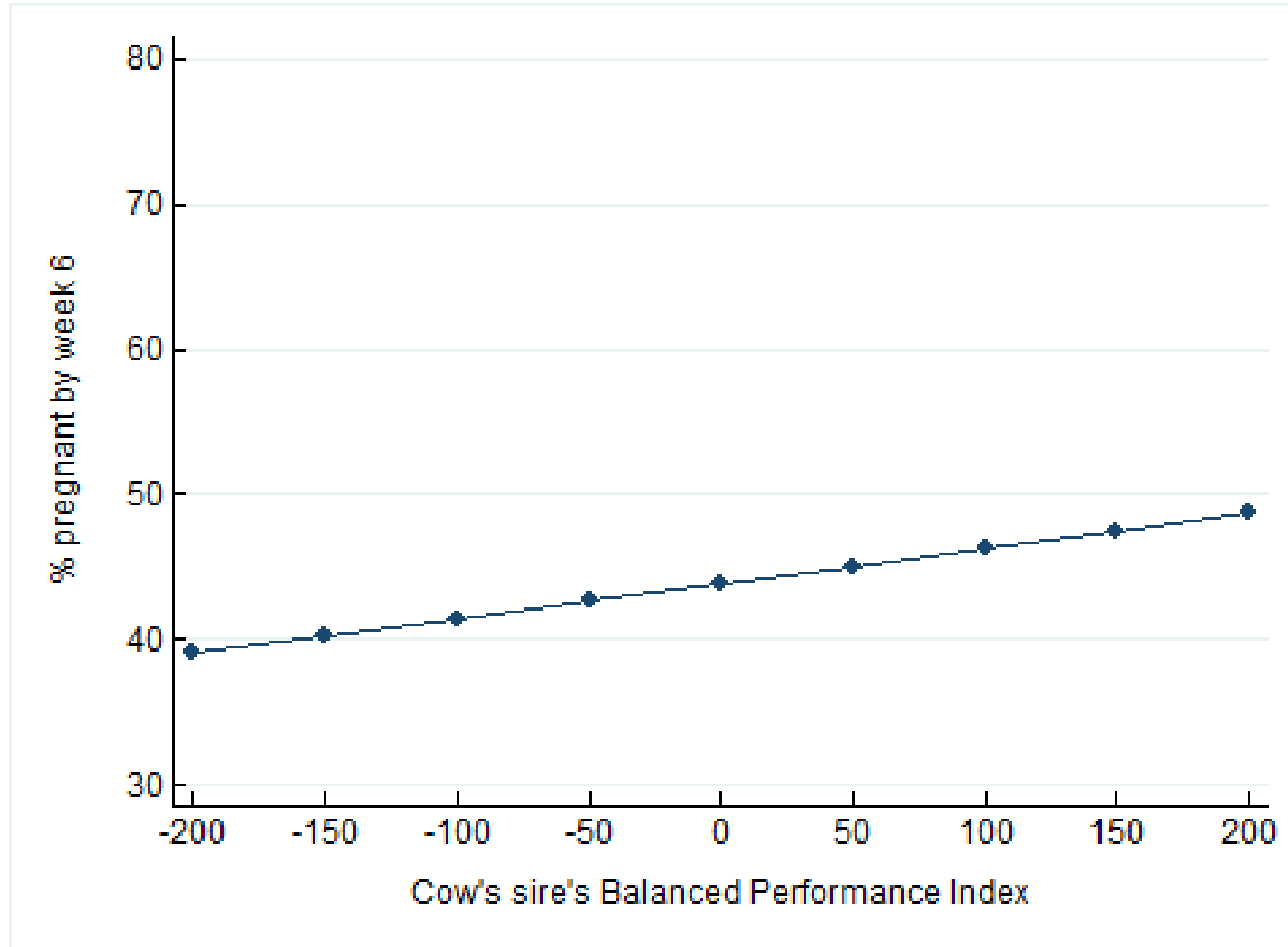
Cow's sired by high BPI sires... have higher production and milk solids



Daughter fertility

- Assessed using the InCalf Fertility Data Project 2011 dataset.
- 74 commercial seasonal and split calving herds, with high quality reproductive data from 1996 to 2010.
- Holstein: 60,433 lactations, 20,543 cows, 64 herds.
- Jersey: 2,838 lactations, 976, 27 herds.

Cow's sired by high BPI sires... are more fertile



Australia's breeding indices

- Cow's sired by high BPI sires were more likely to have calved by 20 months
- Cow's sired by high BPI sires, have higher production and milk solids
- Cow's sired by high BPI sires, have better fertility
- In all feeding systems

Australia's breeding indices

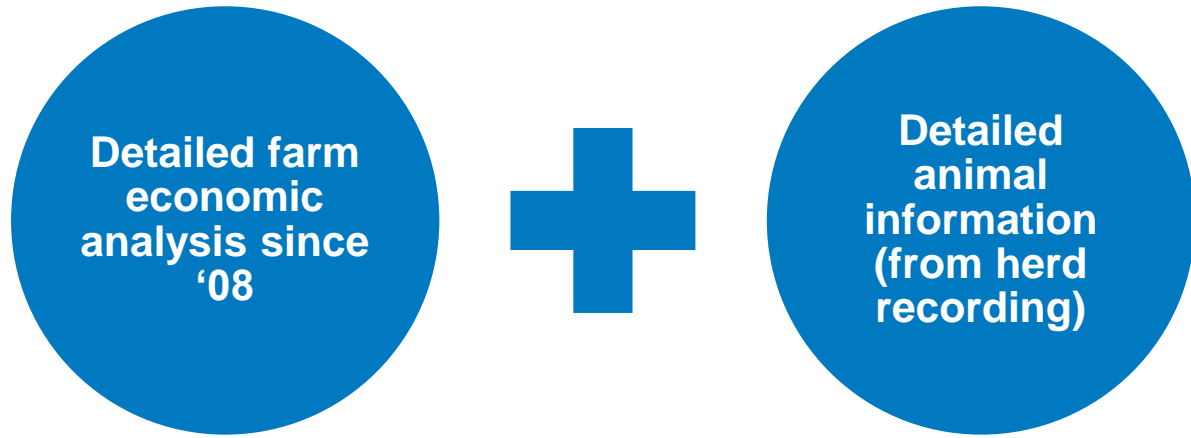
Question 1. What are differences observed on farm between cows sired by high and low index bulls?

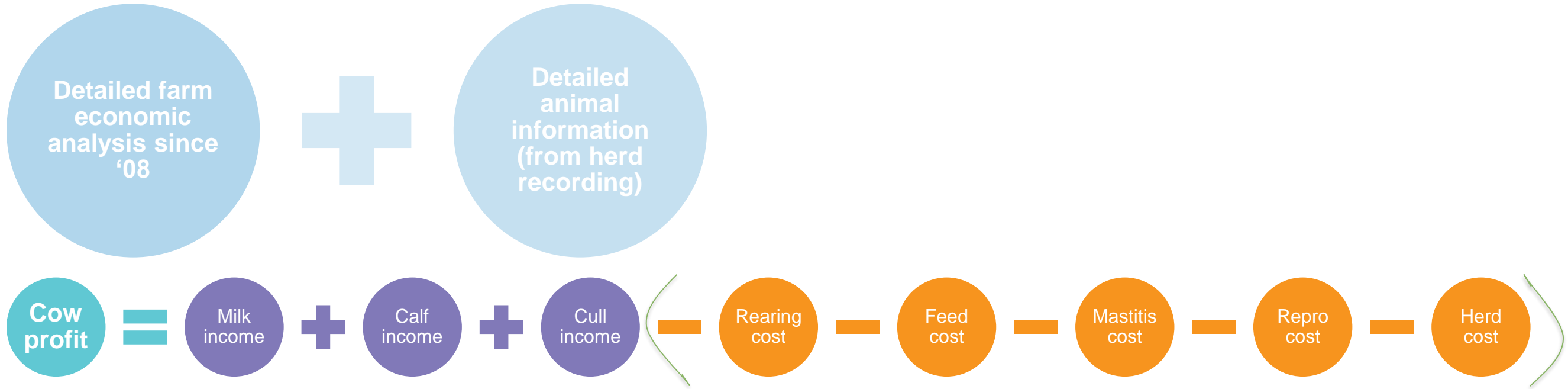
Question 2. Do selection indices select bulls with daughters that perform better in all production systems, or in only one or two production systems?

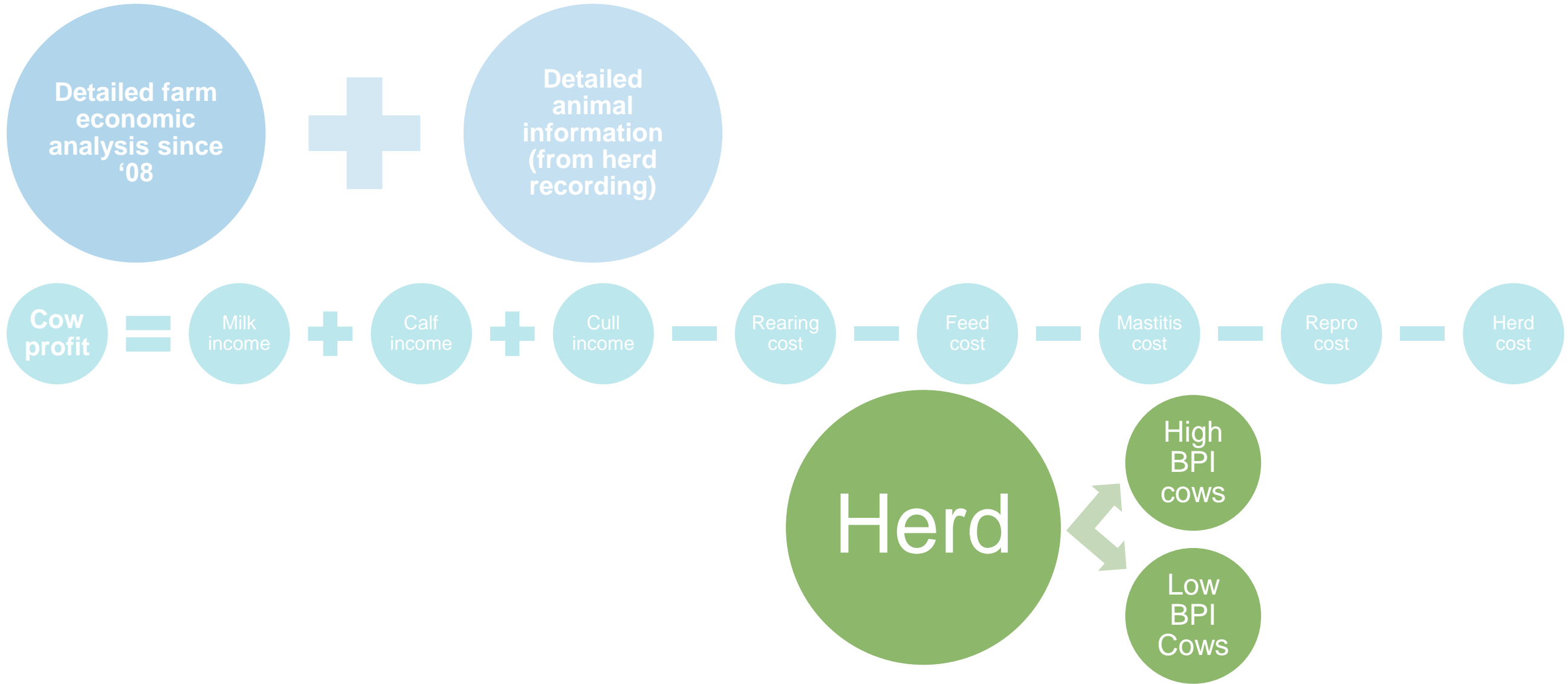
Question 3. Do cows with higher BPI contribute more to farm profit than cows with low BPI?

Improving Herds (Jo Newton)

- Two independent, databases were used to study 3 dairy farms
- Dairy Farm Monitor database collects and analyses detailed financial & farm production data on an annual basis
- DataGene, the national database of cow production, pedigree and ABV records.
- Herds had cow lactation, health and mating records

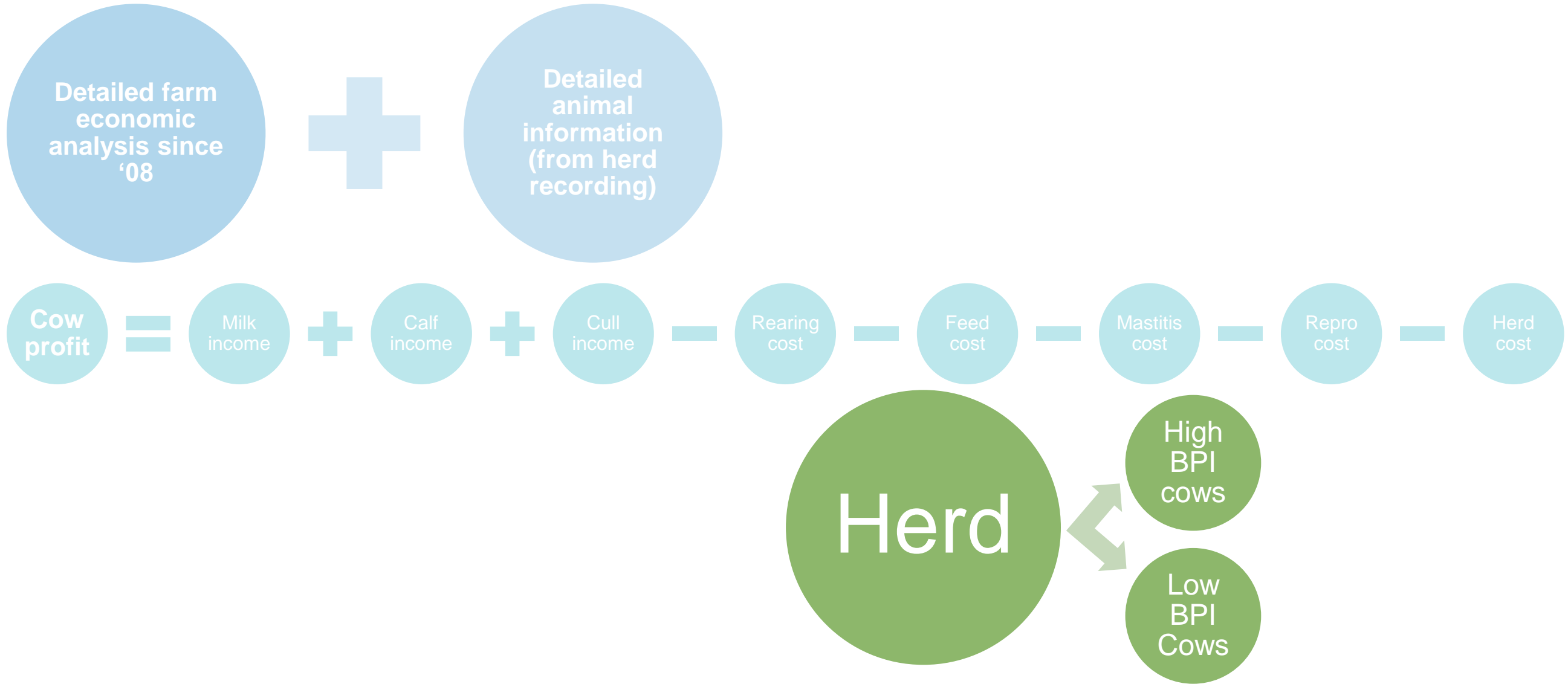






Improving Herds

What?	Value	Explanations
Cost per mastitis case <i>(only health treatment routinely recorded)</i>	\$106.20	From National average (ground truthed) Labour \$30.03 Antibiotics \$20.05 Lost Milk \$46.46 No. treatments 1.1
Cost per pregnancy test	\$5.50	
Cost per AI event	\$60.19	From National average (ground truthed) Straw, Cow service, Drugs, materials etc
Heifer rearing cost	\$1606	National average (direct cost of rearing animal)
Other herd costs	Varied	Adjusted for mating & mastitis costs, rubberware in dairy, vaccinations etc



Difference between high & low BPI subherds

Herd	BPI (\$)
A	78 ^{***}
B	94 ^{***}
C	116 ^{***}

Difference between high & low BPI subherds

Herd	BPI (\$)	Milk (L/yr)	Fat (kg/yr)	Prot (kg/yr)
A	78 ^{***}	434 ^{**}	26 ^{***}	19 ^{***}
B	94 ^{***}	411 ^{**}	20 ^{***}	19 ^{***}
C	116 ^{***}	265 [*]	27 ^{***}	19 ^{***}

Difference between high & low BPI subherds

Herd	BPI (\$)	Milk (L/yr)	Fat (kg/yr)	Prot (kg/yr)	Productive life (months)	Calving interval (days)	Lactation length (days)
A	78 ^{***}	434 ^{**}	26 ^{***}	19 ^{***}	4 ^{NS}	-11 ^{NS}	1 ^{NS}
B	94 ^{***}	411 ^{**}	20 ^{***}	19 ^{***}	5 ^{NS}	22 ^{NS}	19 ^{NS}
C	116 ^{***}	265 [*]	27 ^{***}	19 ^{***}	4 [*]	34 ^{***}	25 ^{**}

Difference in Contribution to Profit

Herd	Cow\$ (\$/yr)
A	178 ^{***}
B	150 ^{**}
C	235 ^{***}

Difference in Contribution to Profit

Herd	Cow\$ (\$/yr)	Income (\$/yr)	
		Milk	Calf
A	178 ^{***}	208 ^{***}	-2 ^{NS}
B	150 ^{**}	185 ^{***}	-7 ^{NS}
C	235 ^{***}	258 ^{***}	-10 ^{***}

Difference in Contribution to Profit

Herd	Cow\$ (\$/yr)	Income (\$/yr)		Costs (\$/yr)				
		Milk	Calf	Feed	AI	Preg test	Mastitis	Rearing
A	178 ^{***}	208 ^{***}	-2 ^{NS}	-42 ^{**}	6 ^{NS}	0 ^{NS}	-3 ^{NS}	52 ^{NS}
B	150 ^{**}	185 ^{***}	-7 ^{NS}	-34 ^{**}	-4 ^{NS}	0 ^{NS}	-3 ^{NS}	55 ^{NS}
C	235 ^{***}	258 ^{***}	-10 ^{***}	-30 [*]	6 ^{NS}	0 ^{NS}	1 ^{NS}	31 ^{NS}

Improving Herds – Contribution to Profit

Herd	BPI (\$)	Cow\$ (\$/yr)
A	78 ^{***}	178 ^{***}
B	94 ^{***}	150 ^{**}
C	116 ^{***}	235 ^{***}

Australia's breeding indices

- Cow's sired by high BPI sires were more likely to have calved by 20 months
- Cow's sired by high BPI sires, have higher production and milk solids
- Cow's sired by high BPI sires, have better fertility
- In all feeding systems
- **Cows with high BPI have a greater contribution to farm profit**

Thank You



Improving Herds team & focus farms

- Focus farms, Mike Goddard, Bill Malcolm, Christie Ho, Claire Waterman, Natalie Nelson & Mary Abdelsayed, Financial data collectors, Paul Douglas, Gert Nieuwhof

Feeding the Genes

- Michelle Axford, Daniel Abernethy, Gert Nieuwhof, Jennie Pryce, Matt Shaffer, Glen Barrett, Steve Little, Neil Moss, Tim Harrington, Ann McDowell, Daniel Abernethy, Gert Nieuwhof, Mike Goddard, Jennie Pryce, and Paul Douglas, Nina Philadelphoff-Puren, Paul Koh, Jakob Malmo, Steve Jagoe, Peter Younis and Dave Colson, Rohan Butler

GARDINER
FOUNDATION



Economic Development,
Jobs, Transport
and Resources

