Effects of specific breeding lines for organic dairy production in Denmark

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Undersøgelsen er en del af Organic RDD 2-projektet SOBcows

STØTTET AF promilleafgiftsfonden for landbrug

Specific organic breeding lines

- When is it better for genetic gain to have a specific breeding goal for organic dairy production in Denmark?

- Depends on the correlation between breeding goals
  - GxE
  - Economic weights
  - Trait definitions
  - Genetic evaluations

- Break-even correlation

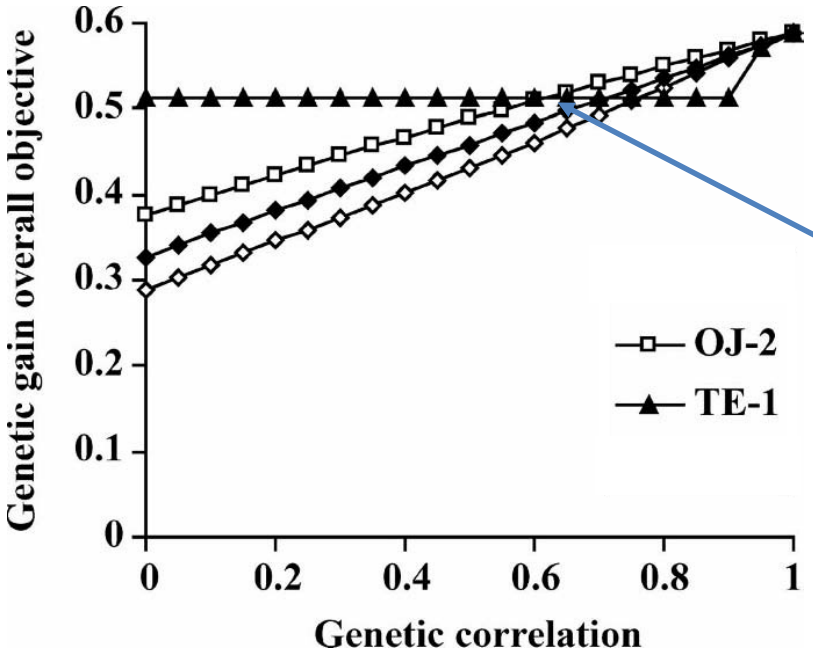
Break-even correlation

- Genetic gain in one joint breeding program =
  Genetic gain in two separate breeding programs

- Han Mulder's thesis (2007)

Break-even correlation with progeny testing

Different with genomic selection?



Break-even correlation

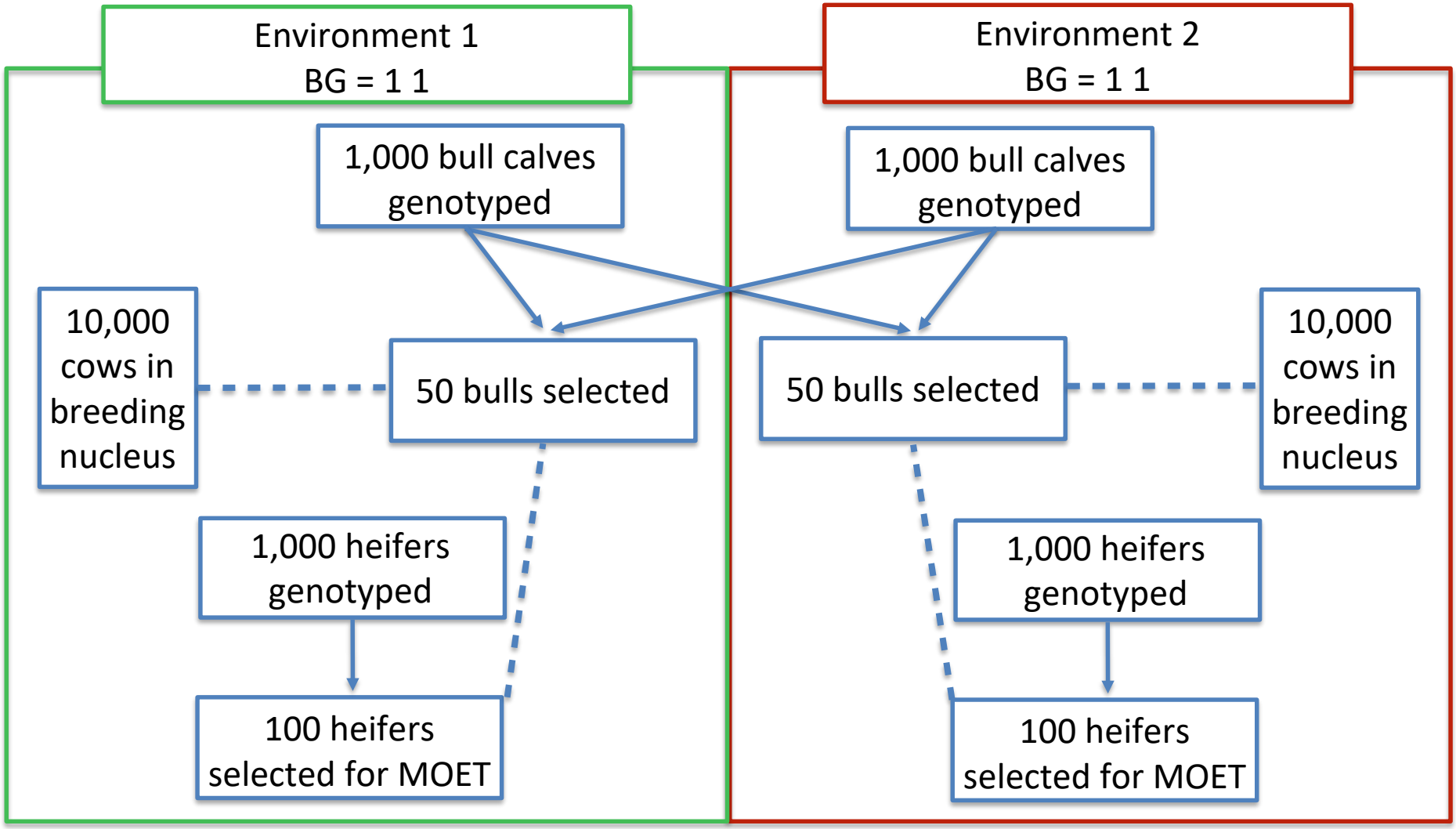
$$\Delta G = 0.5 * \Delta G_1 + 0.5 * \Delta G_2$$

Mulder et al., 2006

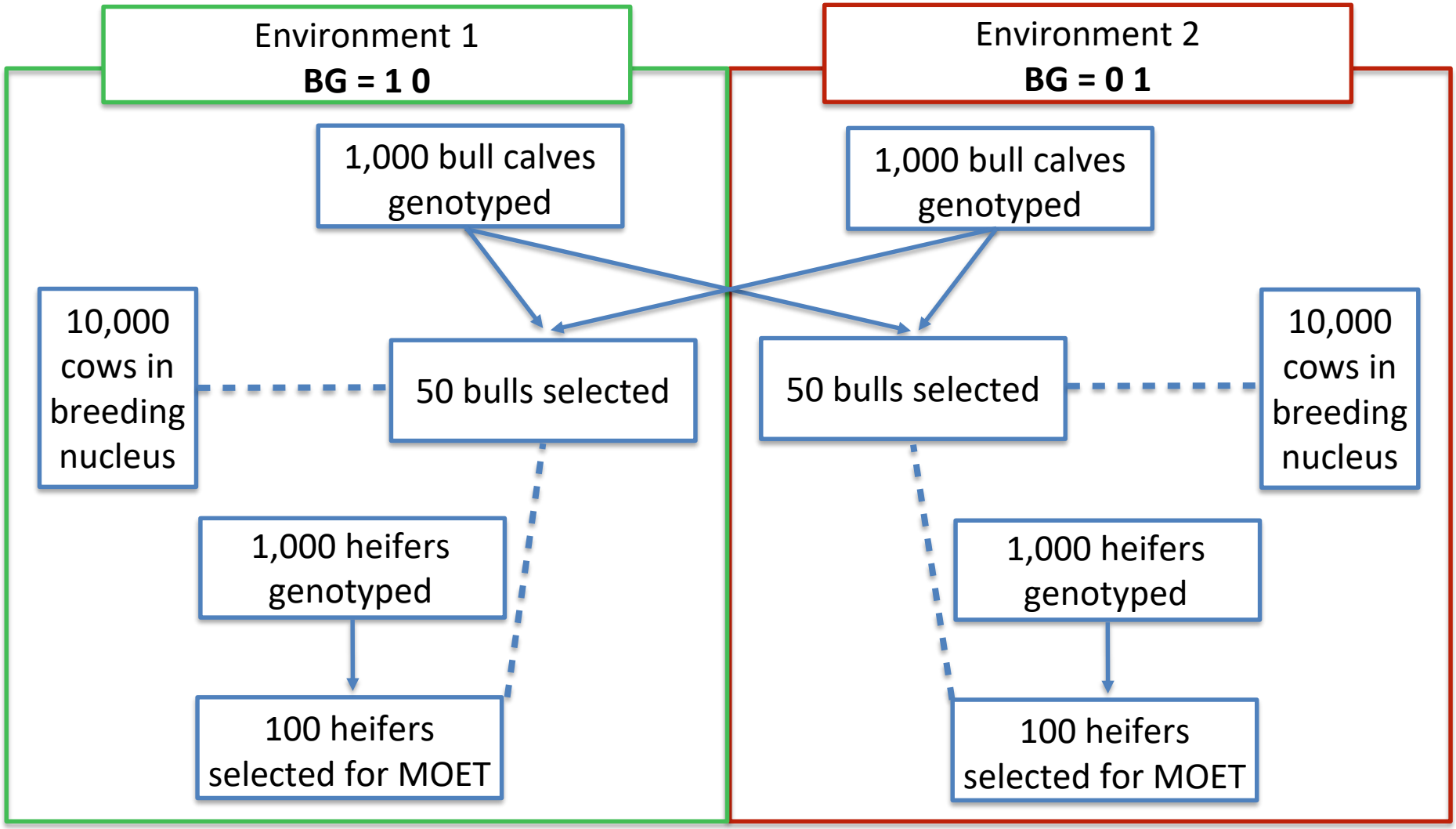
Aims

- Find break-even correlation with genomic selection
- How much genetic gain is lost with a suboptimal breeding strategy?

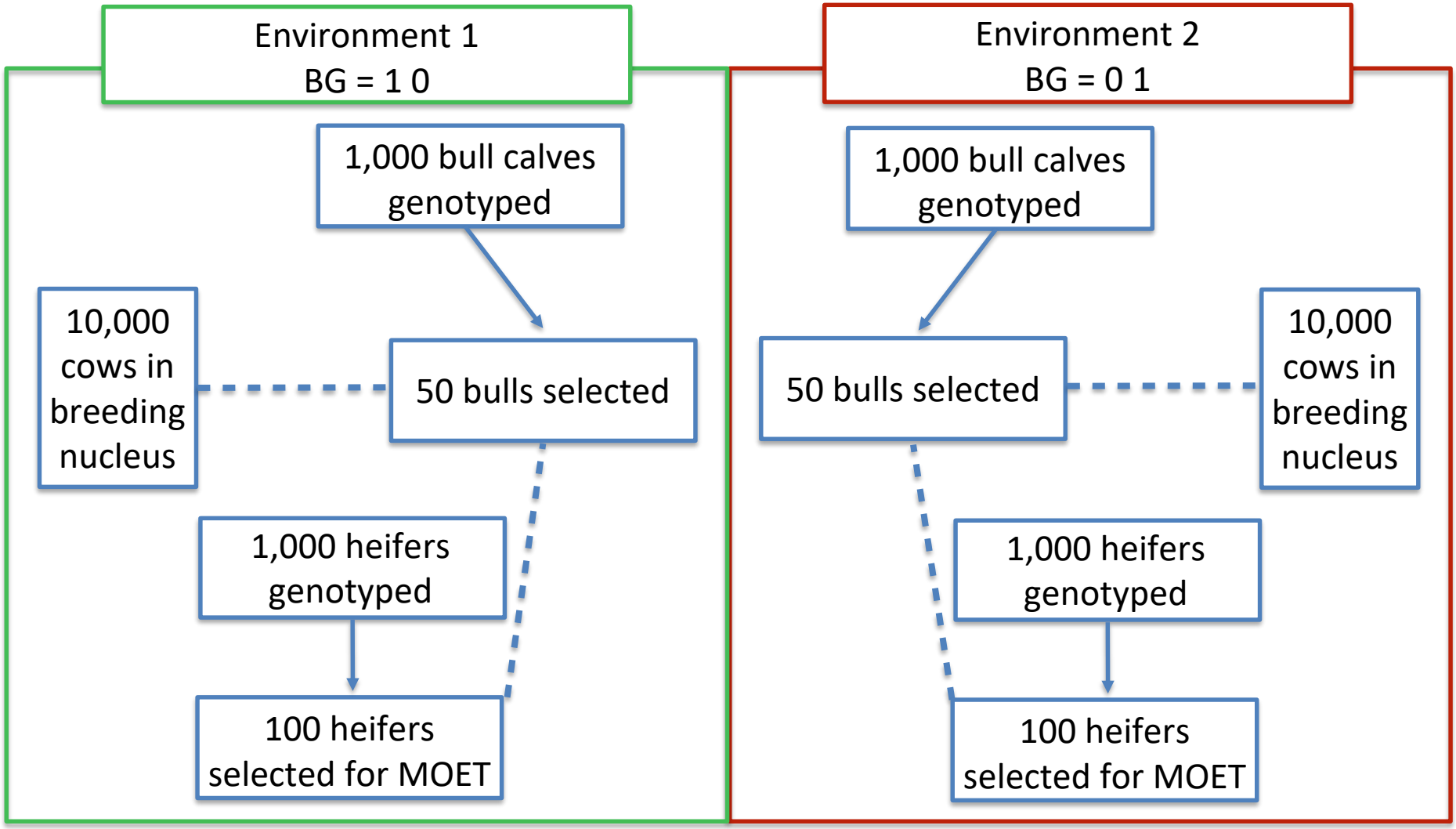
One breeding program



Two breeding programs, across



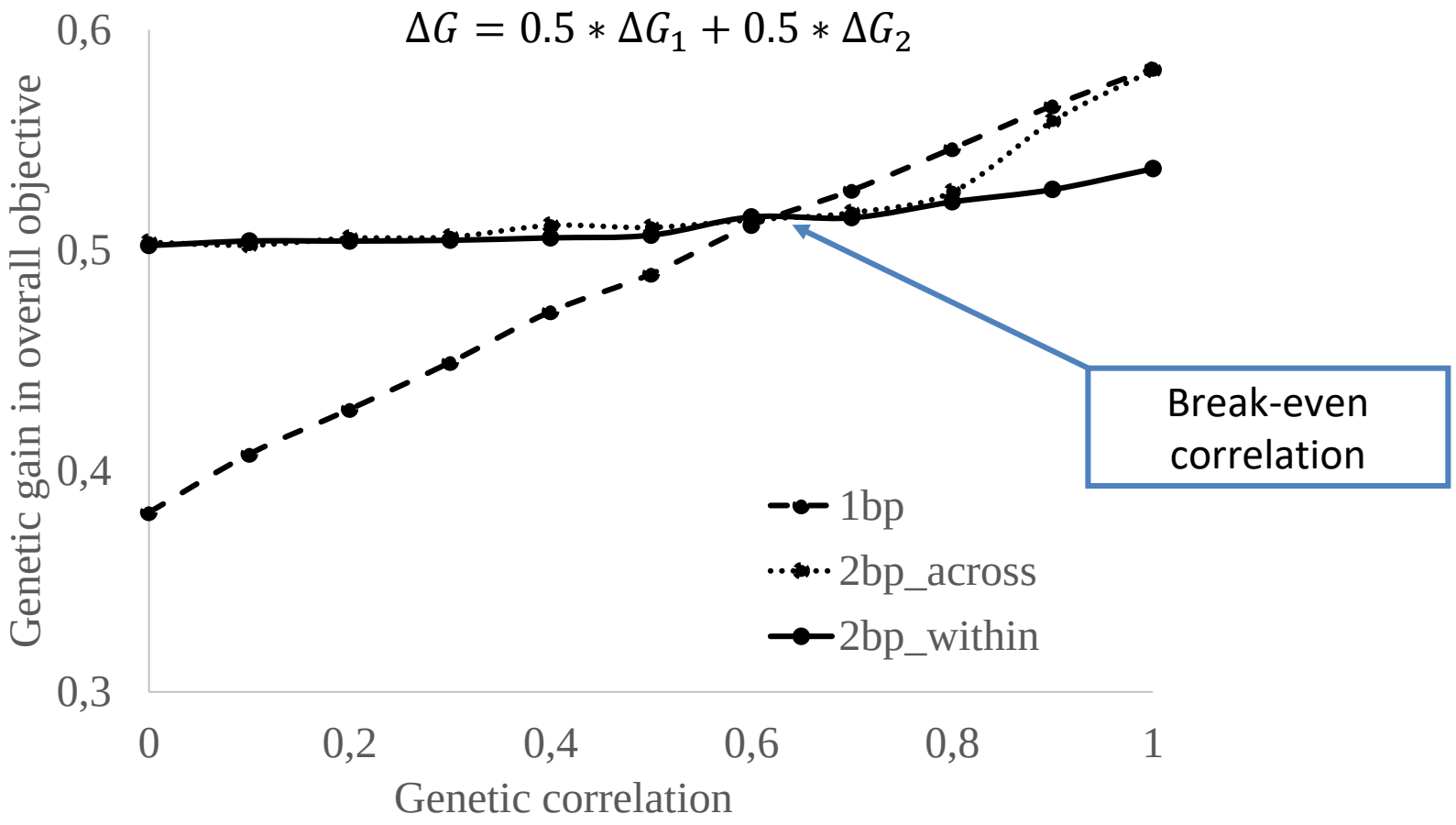
Two breeding programs, within



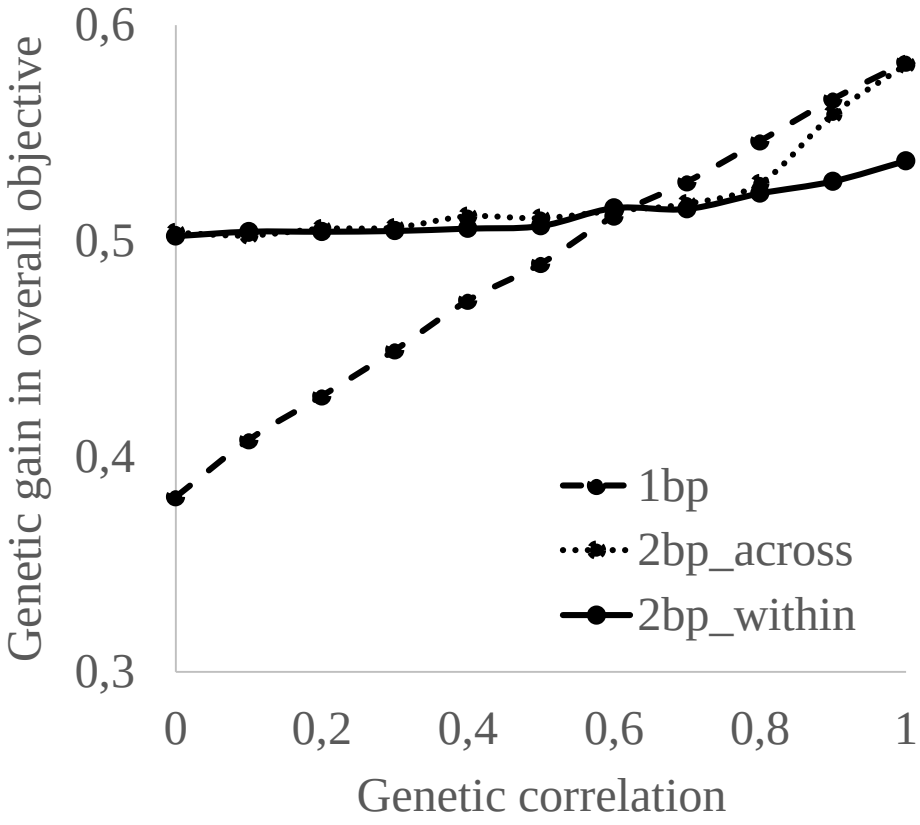
Methods

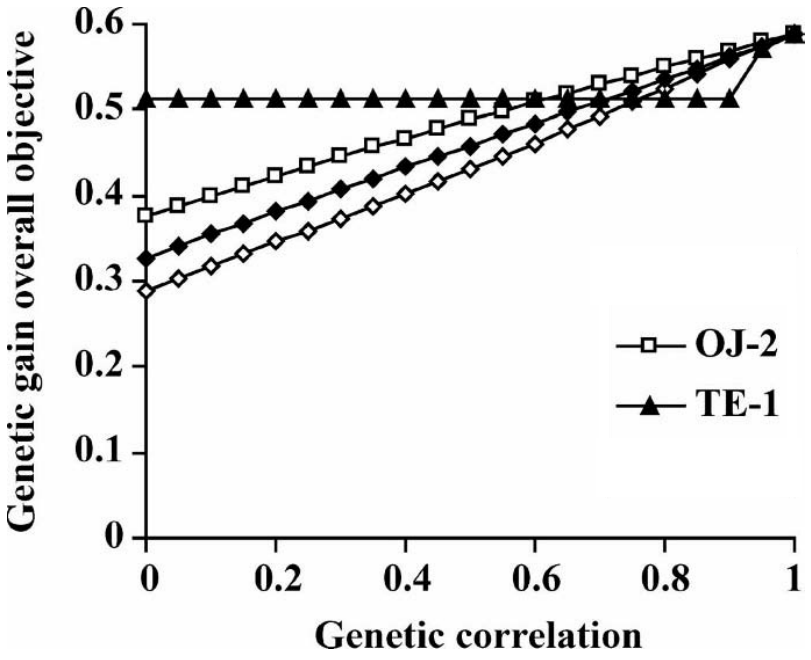
- Stochastic simulation in ADAM (Pedersen et al., 2009)
- Breeding value estimation in DMU (Madsen and Jensen, 2013)
- Pseudo-genomic simulation (Buch et al., 2012; Dekkers, 2007)
  - No markers simulated, instead one trait with genomic information (DGV)

Results


$\Delta G = 0.5 * \Delta G_1 + 0.5 * \Delta G_2$
Genetic gain in overall objective
0,6
0,5
0,4
0,3
0
0,2
0,4
0,6
0,8
1
Genetic correlation
1bp
2bp_across
2bp_within
Break-even correlation

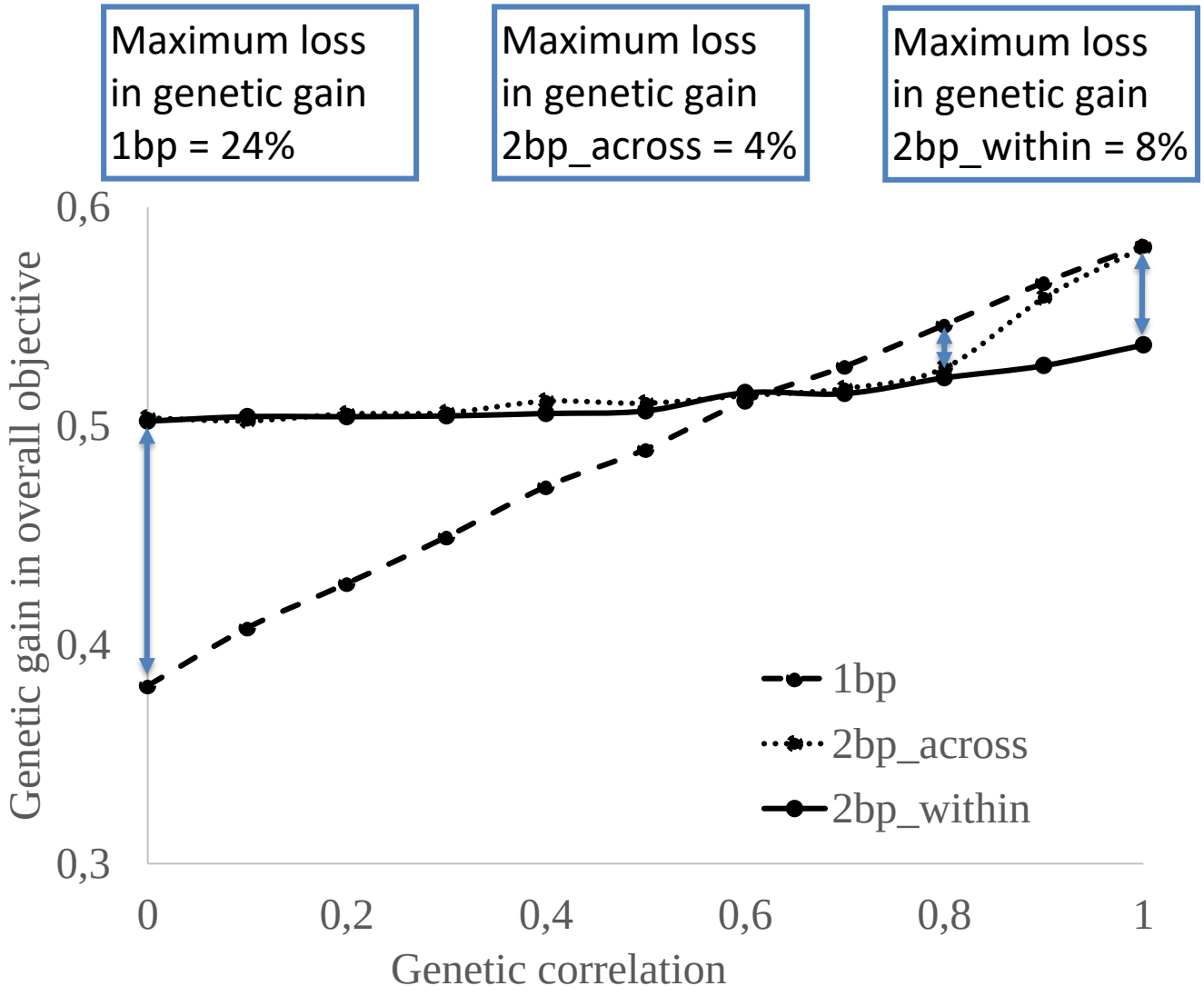
Break-even correlation



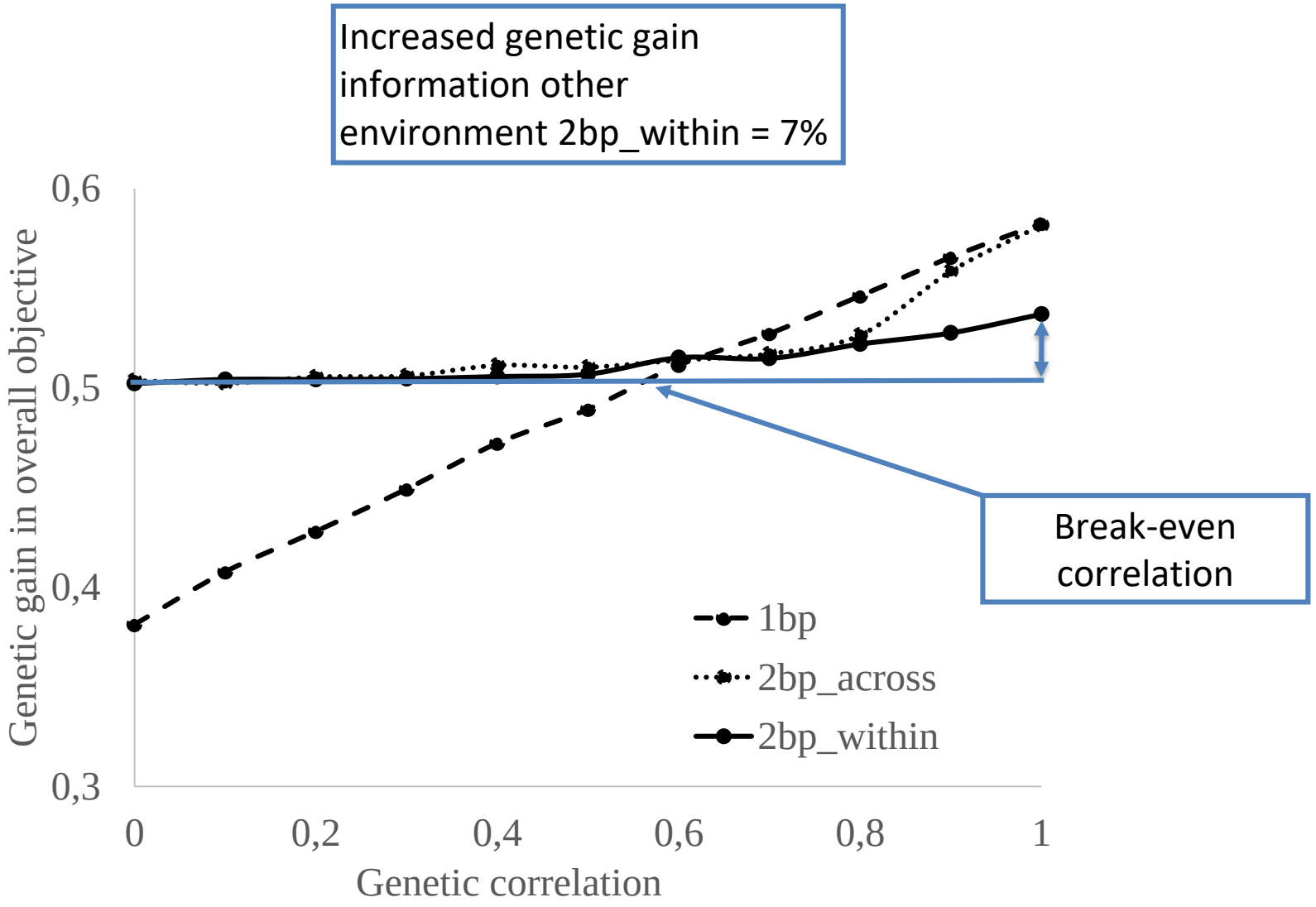


Mulder et al., 2006

Loss in genetic gain



Impact of genomic selection



Conclusions

- Break-even correlation not different with genomic selection with the present assumptions
- Two breeding programs: loss in genetic gain is minimal when selection is not restricted
- Increased genetic gain in strategy 2bp_within due to genomic information from correlated environment
- Implication for organic breeding lines