AARHUS
UNIVERSITET

Genomic Breeding Plans

Line Buch, Morten Kargo, Christian Sørensen

24.11.2010

Annual genetic gain in euros (ΔG)

Scheme	PT	GEBV	ΔG	
Conventional	**+**	**-**	**22.38**	9%
Juvenile	**-**	**-**	**24.44**	
Pre-selection	+	+	28.89	
Turbo	-	+	45.11	

PT = Progeny Testing; GEBV = Genomically Enhanced Breeding Values

Annual genetic gain in euros (ΔG)

Scheme	PT	GEBV	ΔG	
Conventional	**+**	**-**	**22.38**	
Juvenile	-	-	24.44	**29%**
Pre-selection	**+**	**+**	**28.89**	
Turbo	-	+	45.11	

PT = Progeny Testing; GEBV = Genomically Enhanced Breeding Values

Annual genetic gain in euros (ΔG)

Scheme	PT	GEBV	ΔG
Conventional	**+**	**-**	**22.38**
Juvenile	-	-	24.44
Pre-selection	+	+	28.89
Turbo	**-**	**+**	**45.11**

102%

PT = Progeny Testing; GEBV = Genomically Enhanced Breeding Values

Rate of inbreeding per generation in percent (ΔF)

Scheme	PT	GEBV	ΔF	
Conventional	**+**	**-**	**1.15**	**122%**
Juvenile	**-**	**-**	**2.55**	
Pre-selection	+	+	0.48	
Turbo	-	+	0.74	

PT = Progeny Testing; GEBV = Genomically Enhanced Breeding Values

Rate of inbreeding per generation in percent (ΔF)

Scheme	PT	GEBV	ΔF
Conventional	**+**	**-**	**1.15**
Juvenile	-	-	2.55
Pre-selection	**+**	**+**	**0.48**
Turbo	**-**	**+**	**0.74**

-58%

-36%

PT = Progeny Testing; GEBV = Genomically Enhanced Breeding Values

AARHUS
UNIVERSITET

Genotyping strategies using 3K and 50K

Christian Sørensen

24.11.2010

Purposes of genotyping

- Selection
- Reference population

The best solution is not necessarily the same product for selection and for reference

The dilemma

Selection

- screen many
- cheap
- reasonable reliablity

Reference

- many phenotypes
- many markers
- accurate genotypes

So far:

Large proportion of genotypings on bulls with progeny information

⇓

Little ”waste” of genotypings

Now and in the future:

Most genotyped bulls will not get progeny information

⇓

What then, if we can select almost as good and cheaper?

”Optimal” solution for selection

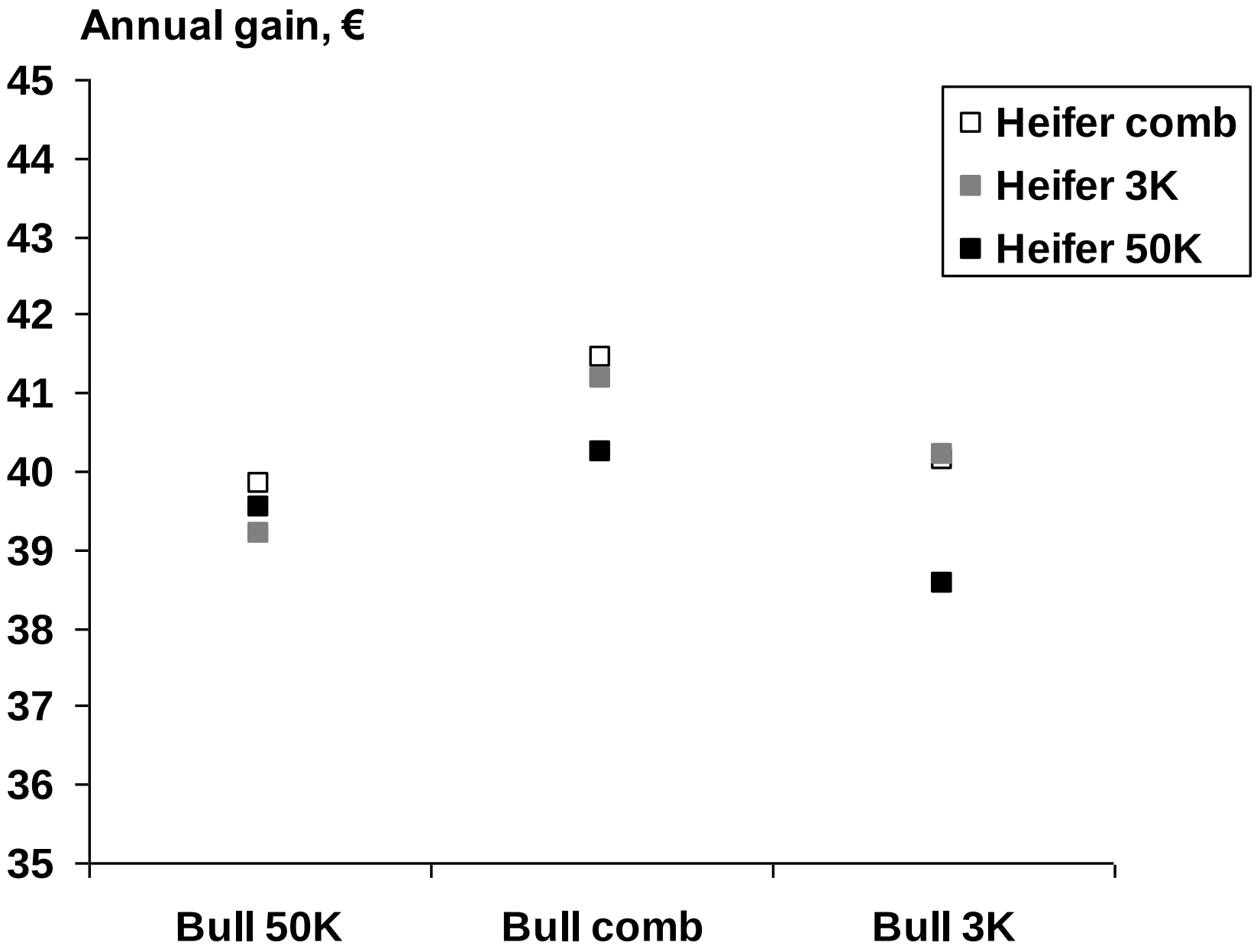
- Equal cost scenarios
- Assumptions:
  - Cost of 50K = 3 x cost of 3K
  - Reliability of 50K: 50%
  - Reliability of 3K: 45%

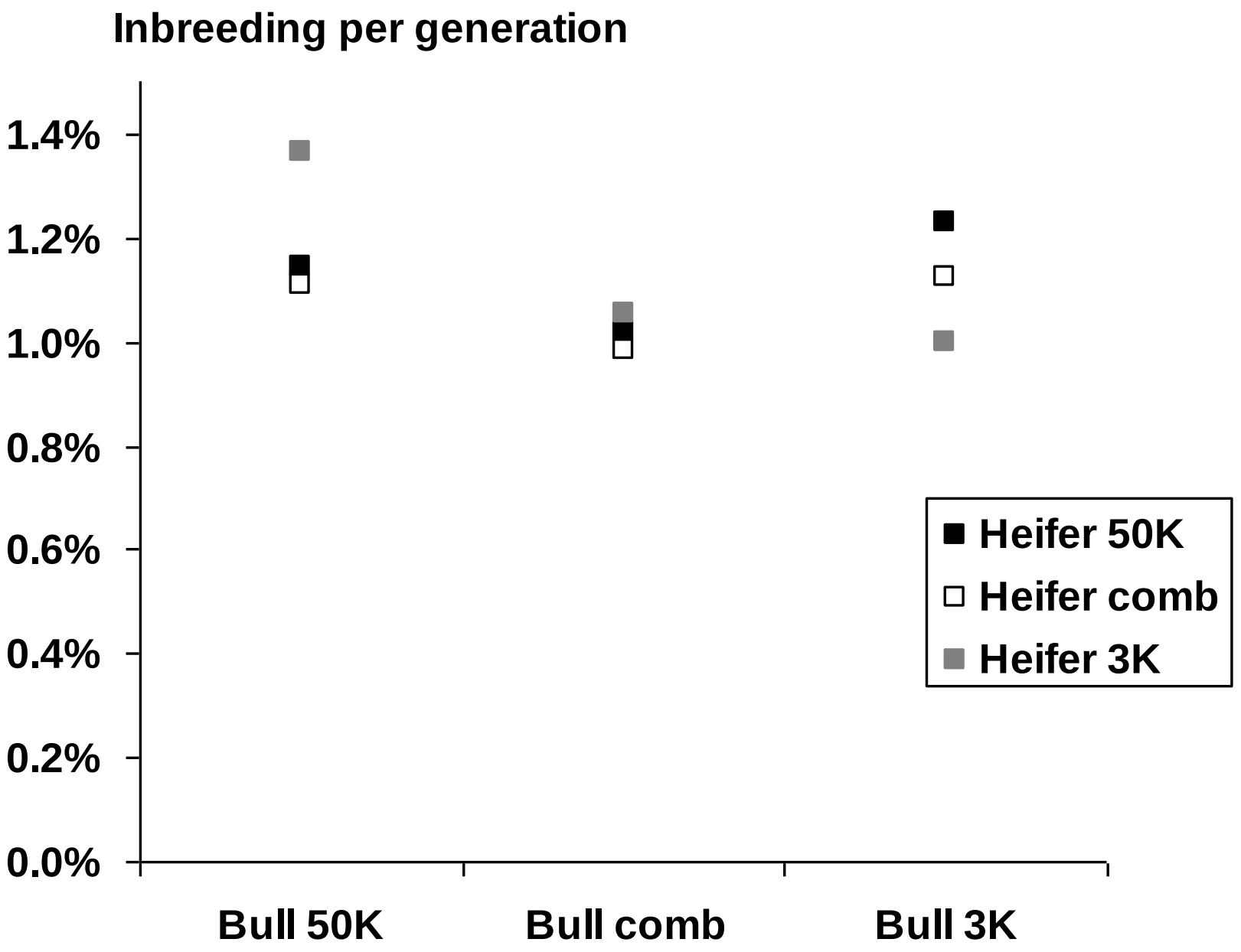
Equal cost scenarios - bulls

	Screening (3K)	Selection (50K)
50 K		1200
Comb	2700	300
3 K	3600	

Equal cost scenarios - heifers

	Screening (3K)	Selection (50K)
50 K		500
Comb	900	200
3 K	1500	


Annual gain, €
45
44
43
42
41
40
39
38
37
36
35
Heifer comb
Heifer 3K
Heifer 50K
Bull 50K
Bull comb
Bull 3K


Inbreeding per generation
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
Bull 50K
Bull comb
Bull 3K
Heifer 50K
Heifer comb
Heifer 3K

Conclusion

From a selection point-of-view:

3K genotypings are useful
but can not stand alone

From a reference population point-of-view:

?