



IRISH CATTLE BREEDING FEDERATION

Practical Aspects of Implementing Genomic Selection in Ireland

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Herd Recording Managers Workshop
12-14 May 2009 – Porec, Croatia.

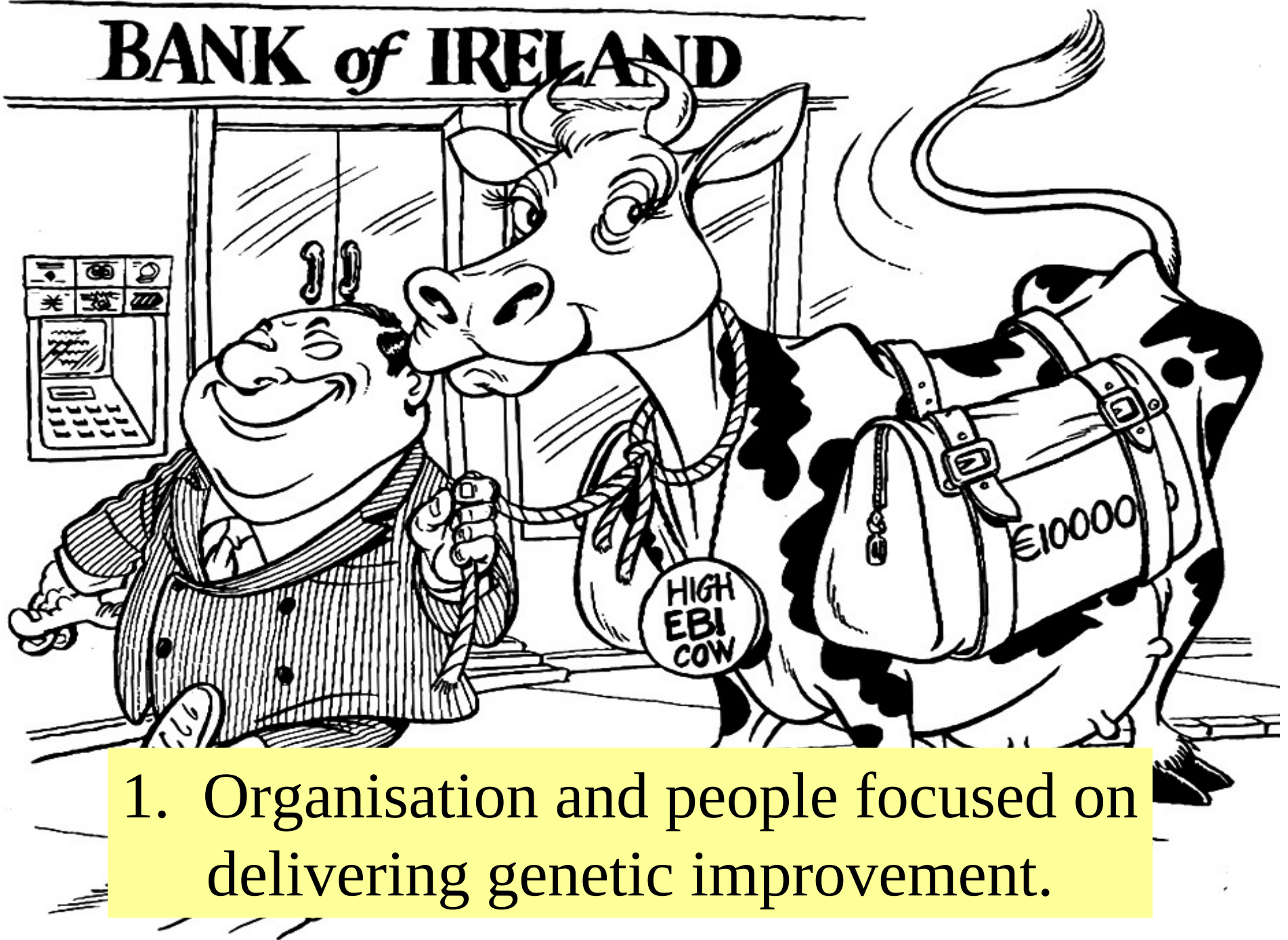
Practical Aspects

Organisations & people to:

- provide data needed for the research
- do the research
- implement the findings

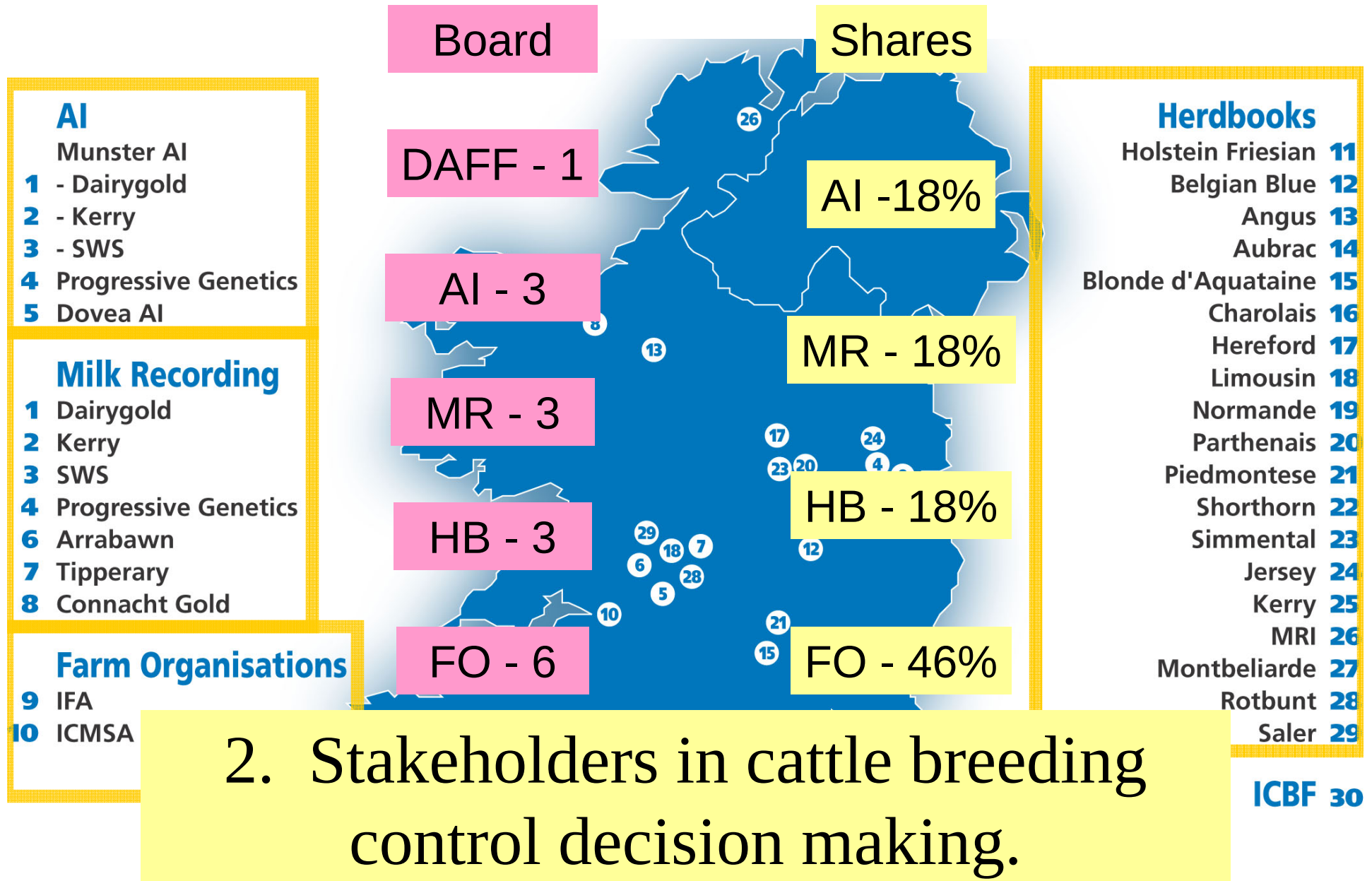
Irish Cattle Breeding Federation Society Limited (ICBF)

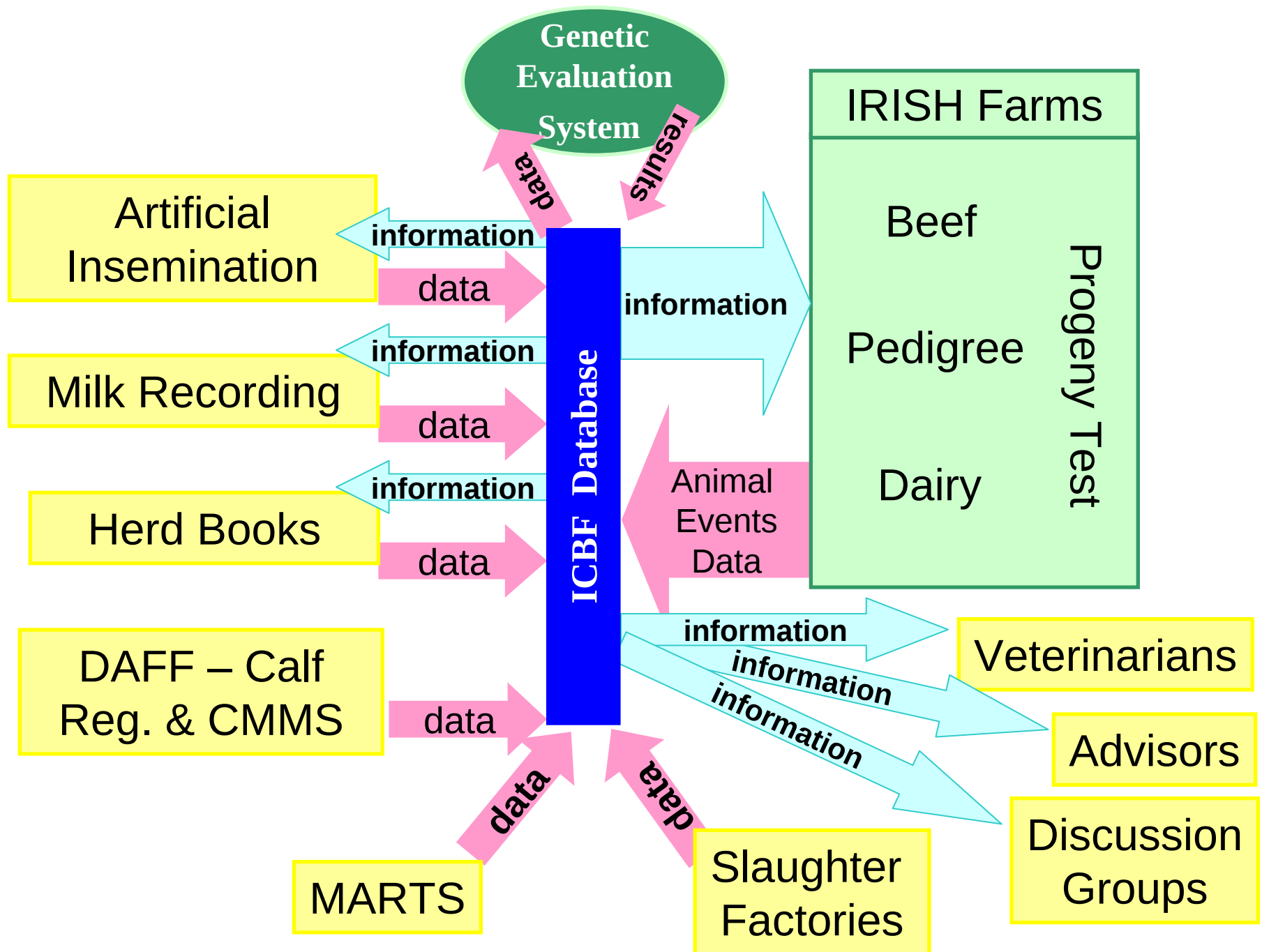
- *Established with interim Board in 1997*
- *Commenced operations in 1998*
- *Current structure in 2000*
- *Mission: achieving the greatest possible genetic improvement in the national cattle herd - Dairy and Beef*

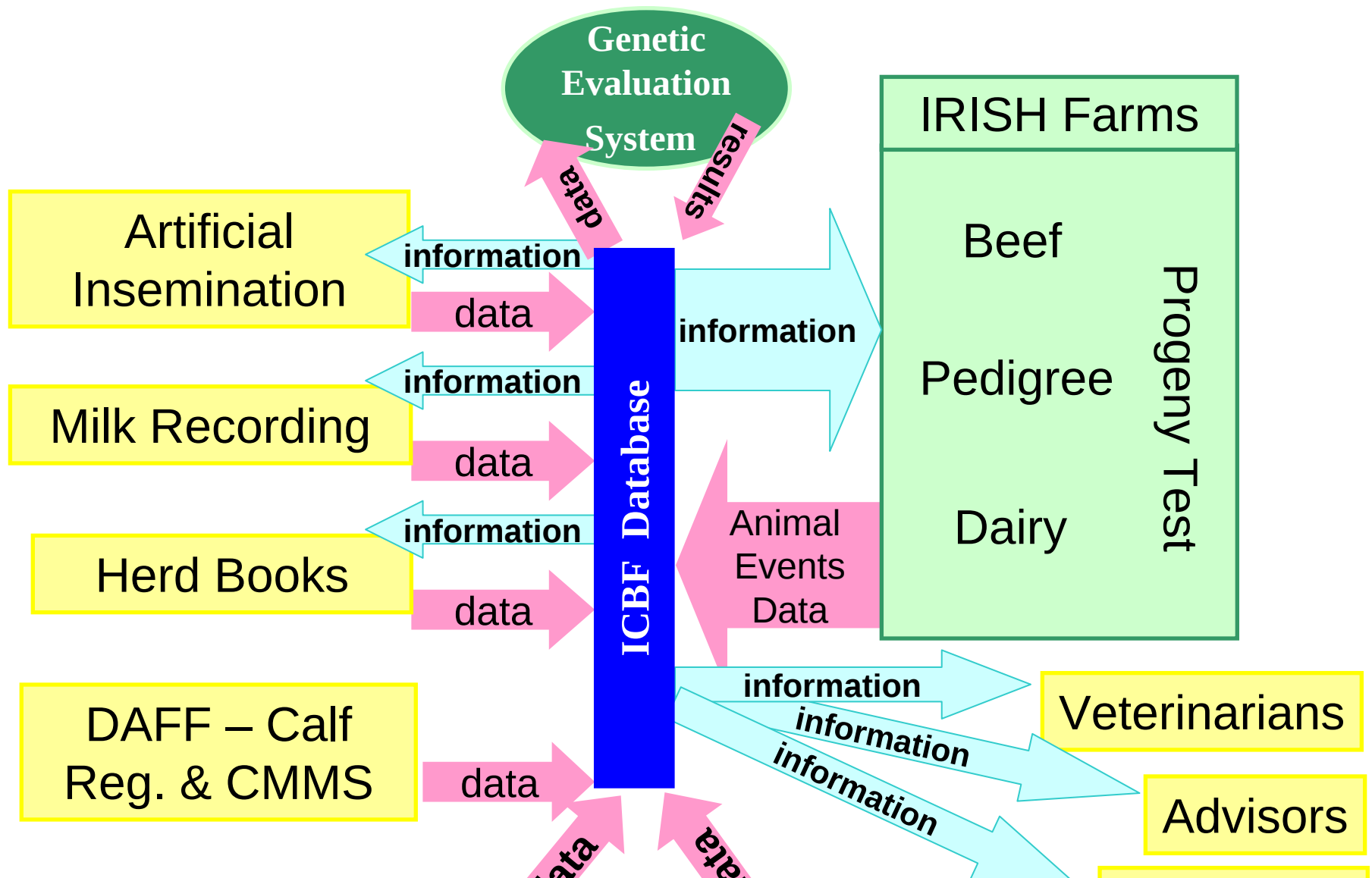


1. Organisation and people focused on delivering genetic improvement.

MEMBERS, BOARD & SHARES - ICBF







3. Phenotypes needed to research genomic selection.

Research

- TEAGASC

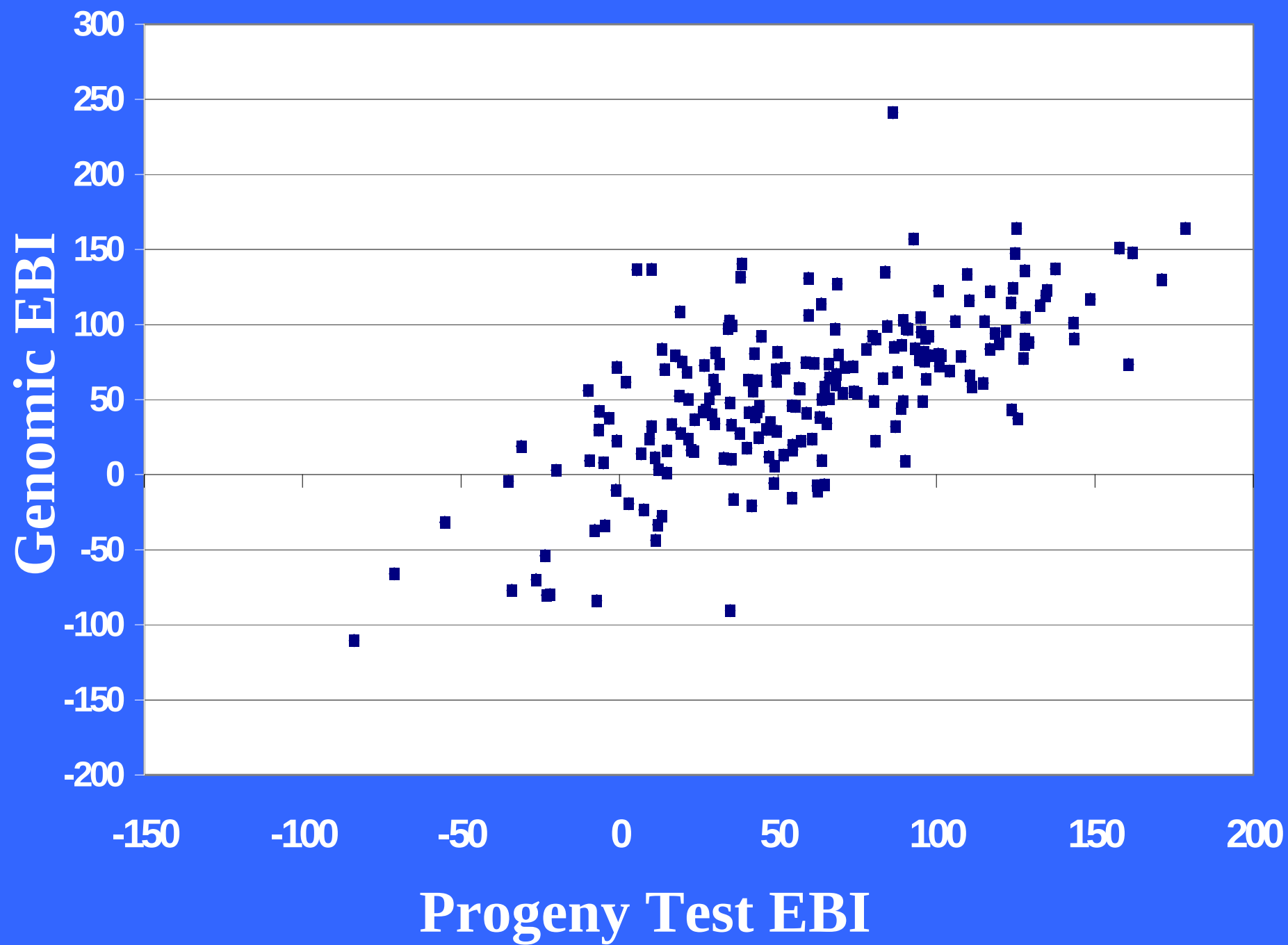
- State research body
- Committed to genetic research
- Committed to developing scientists
- Collaborates closely with ICBF
- Collaborates with international leaders
- Funding for genotyping of 1,200 bulls

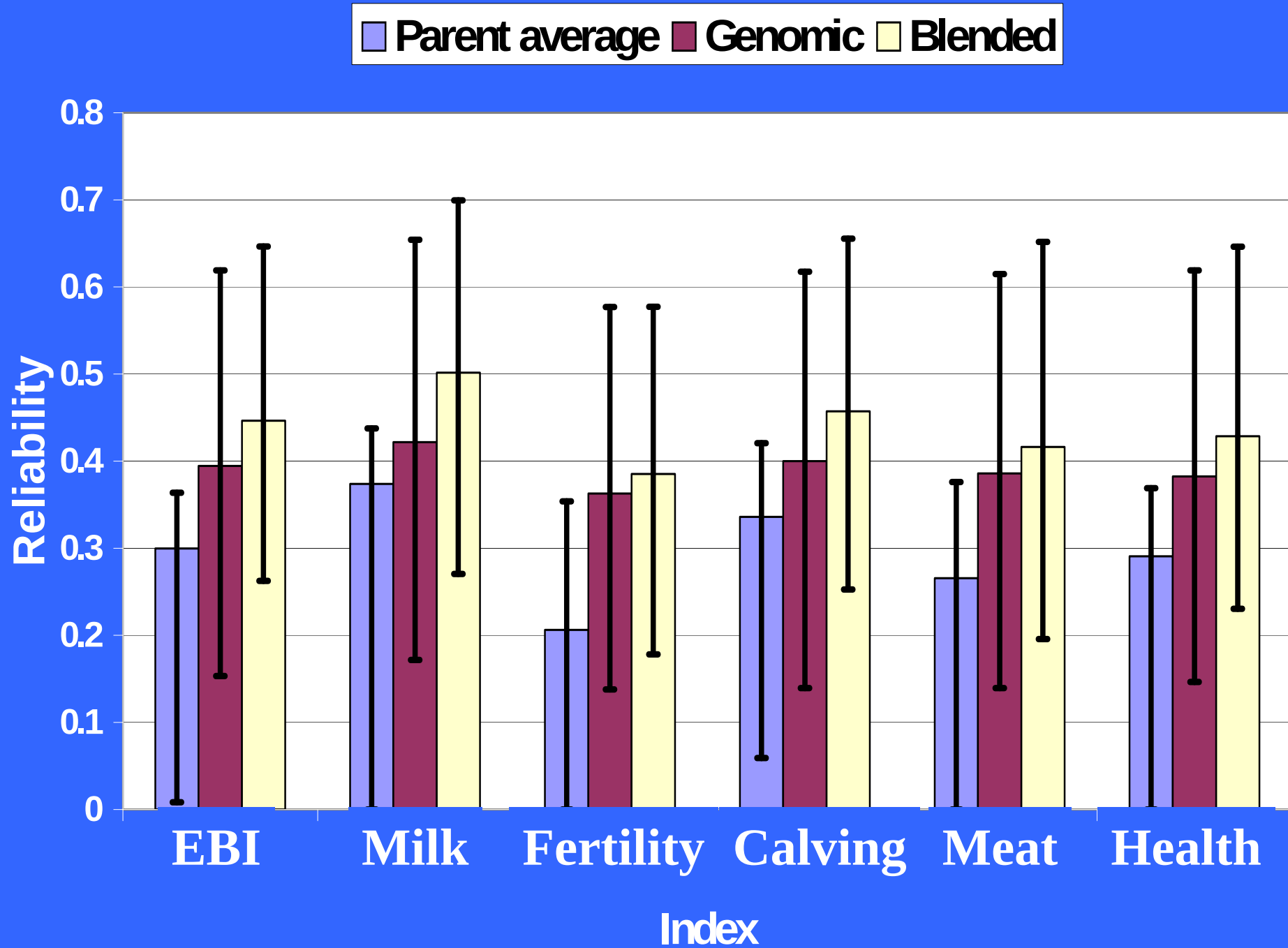
4. Research partner with skills, funds, & motivation.

Research – Genomic Selection

- DNA from 1,200 HF bulls with Irish progeny tests results
- Genotyped with 54K SNP Chip
- Results correlated with progeny test results
- Gave 15% increase in reliability (over ancestry only information)

5. Research established the benefit of genomic selection.



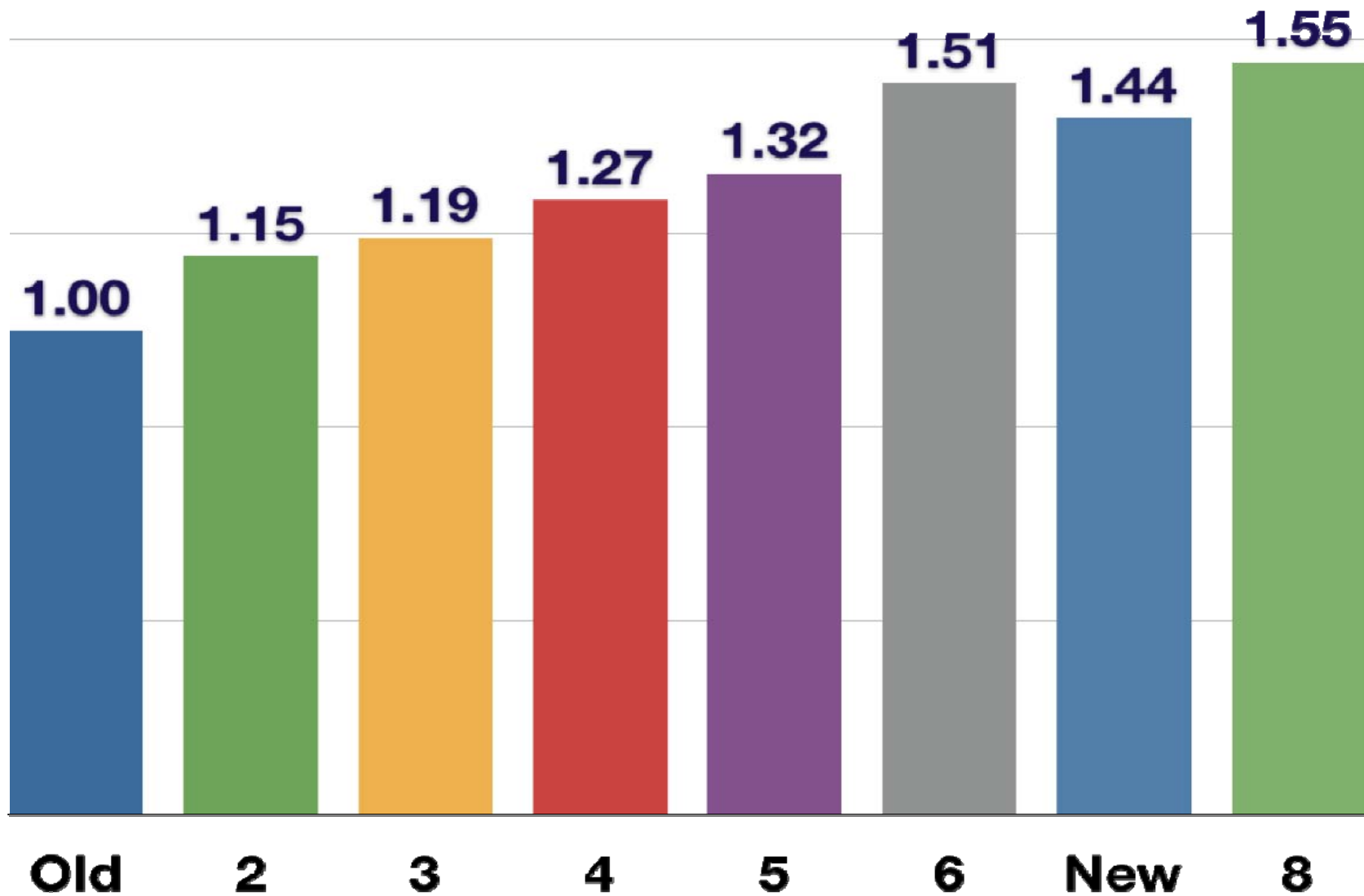


Research – Breeding Scheme Implications

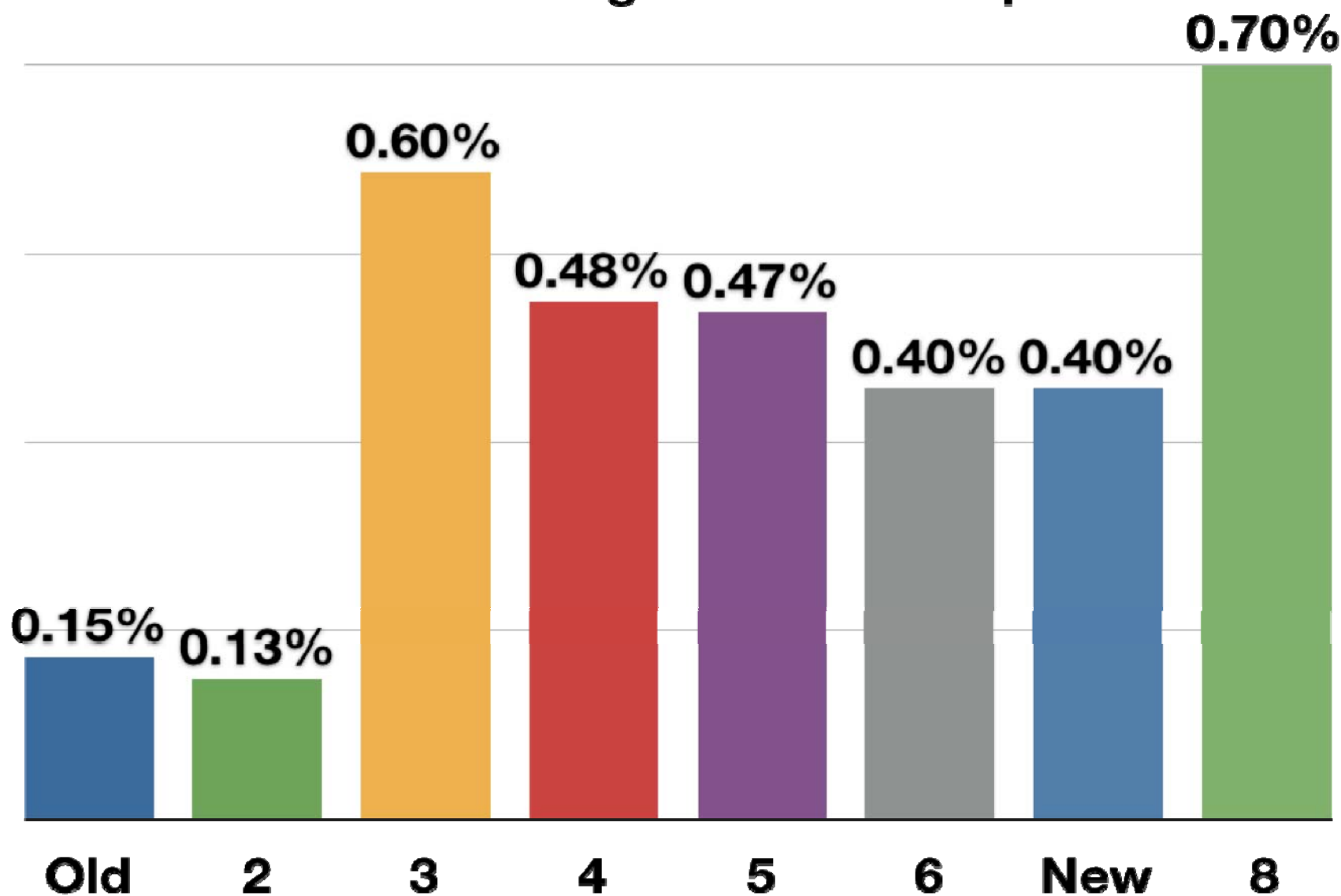
- What is the impact of genetic evaluations on young bulls being 15% more reliable than ancestry only information?
- ICBF commissioned research – Theo Meuwissen – breeding scheme implications.

6. Contracted a researcher to find the answer to breeding scheme implications question.

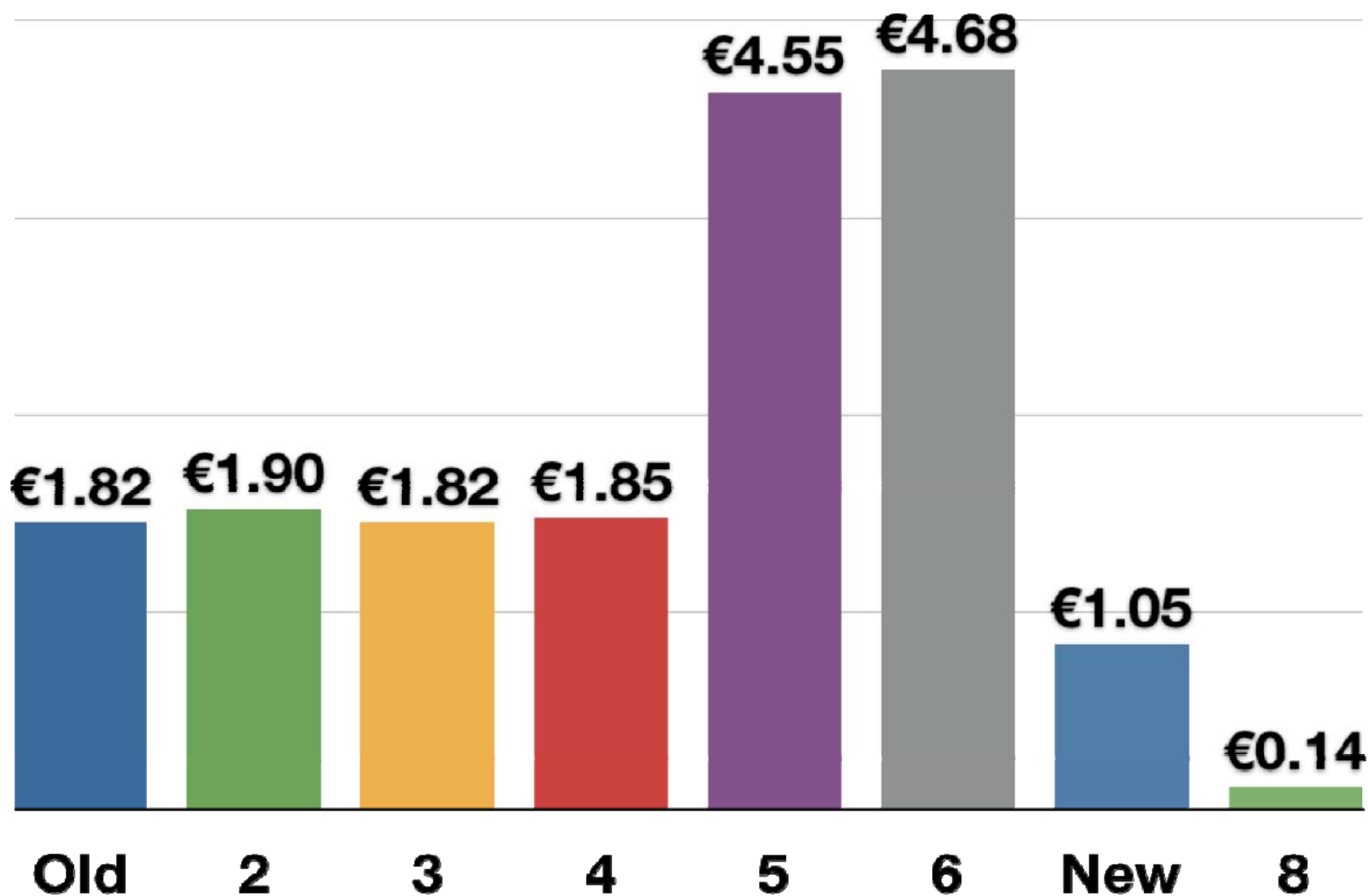
Genetic Gain Relative to "Old"



Annual inbreeding increase for options.



Annual operating cost for options (€/cow).



Research Results – Optimal Design for Ireland

- Genotype 500 young bulls/year.
- Progeny test best 100 of these with 100 milk recorded daughters.
- Use best bulls (proven & genomically selected) to breed dairy replacements.
- Extra genetic gain, increased inbreeding, & lower cost.

Research Results

- Genotype 500 young bulls/year.
- Progeny test best 100 of these with 100 milk recorded daughters.
- Use best bulls (proven & genomically selected) to breed dairy replacements.

Extra genetic gain increased

7. Research identifies the optimal breeding scheme design for Ireland.

Key Decisions

- Progeny test – reduce incentives (cost saving).
- Use GS bulls for breeding herd replacements.
- Modify communications to farmers to accommodate GS.

8. Translate breeding scheme research into operational detail.

Key Messages to Farmer

- Genomics is a technology for increasing the rate of genetic improvement.
- The best of the GS bulls should be considered for breeding herd replacements.
- Use GS bulls in teams to reduce risk.

ICBF Active Bull List



ICBF Active Bull List

Bull Details					EBI Proof Details			
Rk	Code	Name of Bull			Rel	Range	Proof	
1	OJI	O-BEE MANFRED JUSTICE	Daughter Proven In Ireland		5%	+/-€65	DP-IRL	
2	RXO	RAMOS			4%	+/-€60	DP-INT	
3	HTH	HAZAEI LIGHT DETECTOR S2F	Genomically Selected		3%	+/-€89	GS	
4	OLG	BALLIVOR OLYMPIC GOLD ET			3%	+/-€89	GS	
5	BYJ	BALLYDEHOB JUSTICE			3%	+/-€81	GS	
6	HZL	HILLSDALE LIONEL	RUU	91	€188	57%	+/-€77	GS
7	RXR	MONAMORE ROMERO ET	Daughter Proven International		4%	+/-€80	GS	
8	GIO	GIBOR			4%	+/-€80	DP-INT	

Conf.
Interval

> 35%

Daughter Proven
In Ireland

Genomically
Selected

Daughter Proven
International

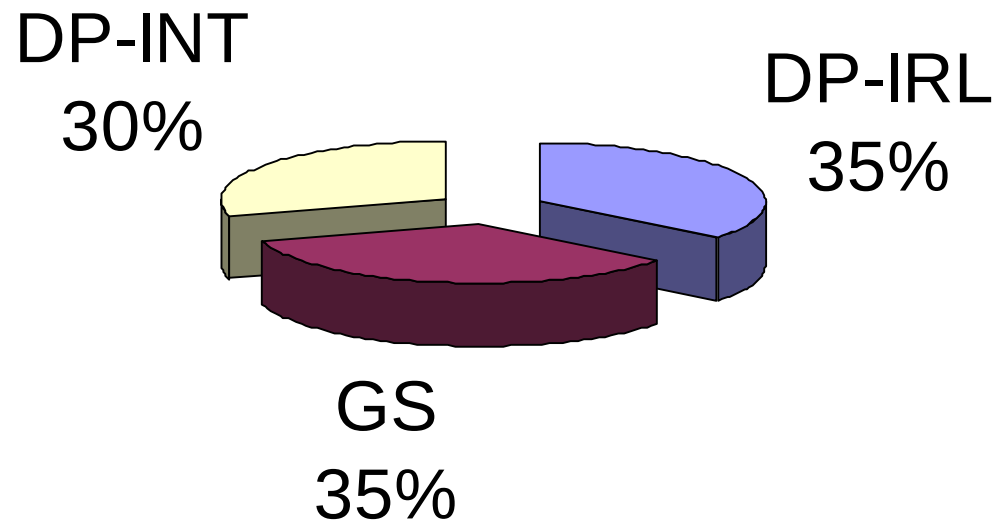


Communication with farmers

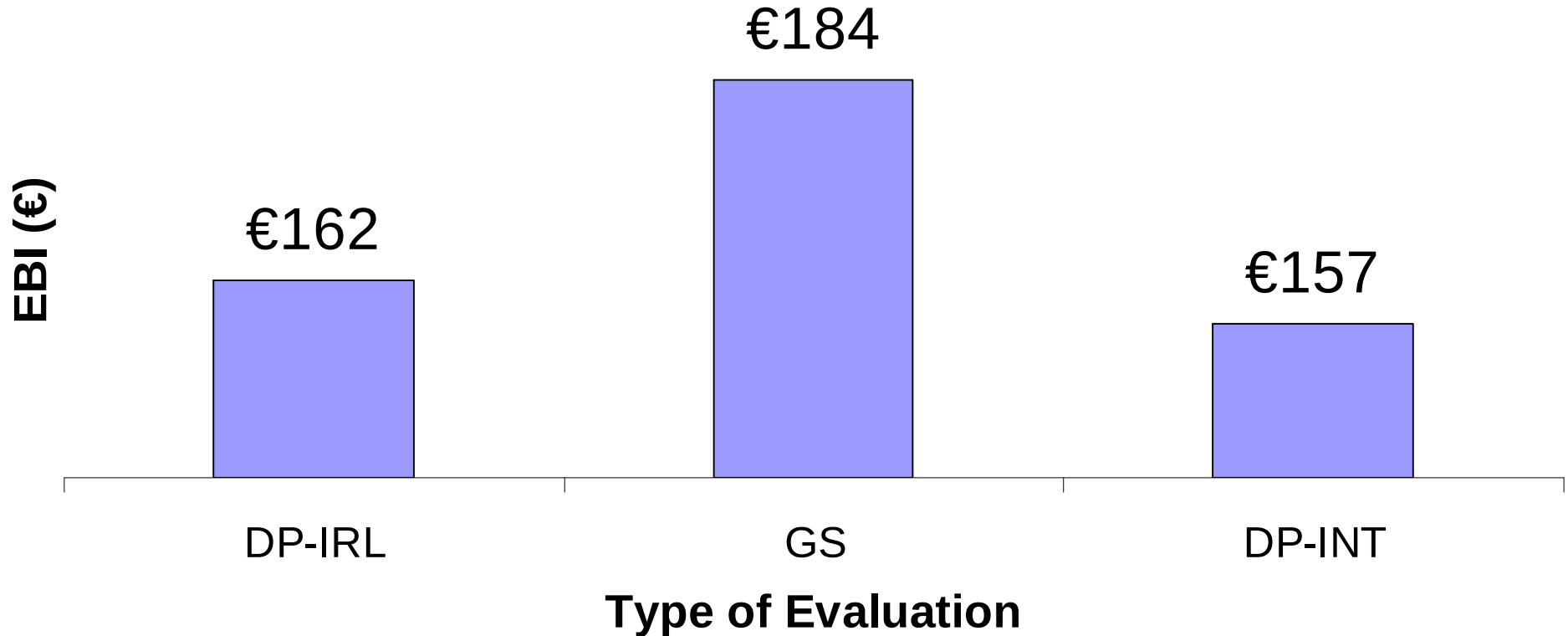
- National farming press – full page each week for 16 weeks covering breeding season.
- Letter and fact sheet to 12,000 dairy herds.
- Website – www.icbf.com
- Staff and Advisors

9. Communicate.

**Breakdown of (64,000) recorded inseminations in March
& April 2009 by bull proof type.**



Avg EBI of recorded inseminations March & April 2009



10. Monitor Progress

Future Priorities

- Streamline genotyping
- Streamline genetic evaluation process
- Expand training population through collaboration – more bulls & breeds – key role for Interbull
- Research beef – 500K SNP chip, across breeds, seeking collaborators

11. Invest in future developments.

- 1. Organisation and people focused on delivering genetic improvement.**
- 2. Stakeholders in cattle breeding control decision making.**
- 3. Phenotypes needed to research genomic selection.**
- 4. Research partner with skills, funds, & motivation.**
- 5. Research established the benefit of genomic selection.**
- 6. Contracted a researcher to find the answer to breeding scheme implications question.**
- 7. Research identifies the optimal breeding scheme design for Ireland.**
- 8. Translate breeding scheme research into operational detail.**
- 9. Communicate.**
- 10. Monitor Progress**
- 11. Invest in future developments.**

Acknowledgements

