



IRISH CATTLE BREEDING FEDERATION

How genomic selection is increasing the profitability of the Irish dairy herd.

Brian Wickham
Chief Executive, ICBF.

SMO Conference – Melbourne, Australia
Applied Genomics for Sustainable Livestock Breeding
Thursday 5th May 2011



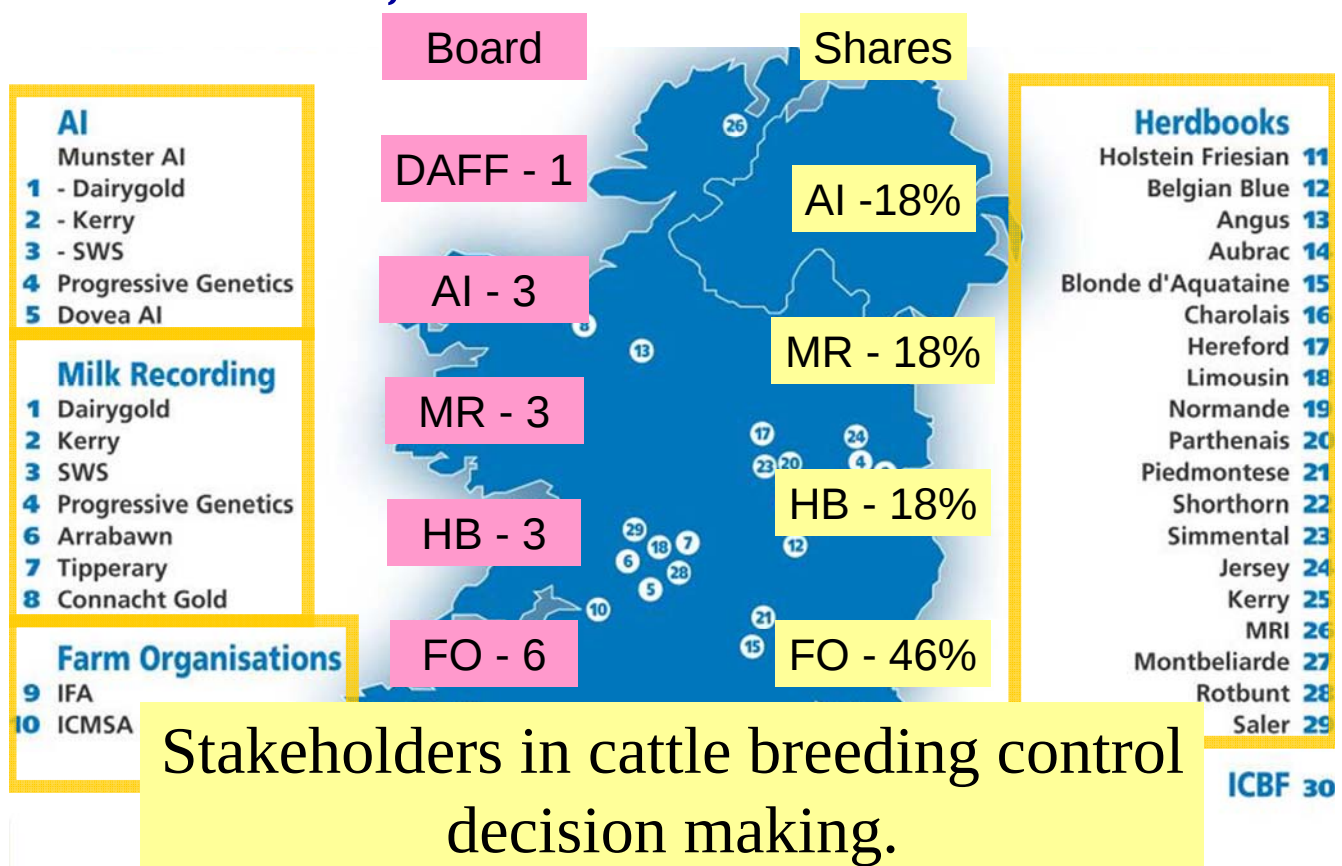
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Content

- Background
- What do Irish farmers want?
- Genomic key for Ireland
- Farmer communications
- AI industry response
- Uptake of GS bulls
- Genetic trends
- Changes to Breeding scheme design

BACKGROUND & STRUCTURE

MEMBERS, BOARD & SHARES - ICBF



BREEDING OBJECTIVE & SELECTION CRITERIA

What do Irish dairy farmers want?

Breeding Objective

- Income (€) ++++
 - Milk (protein, fat, - lactose, - water)
 - Meat
 - Surplus animals
 - Breeding stock
- Expense (€) -----
 - Grass & purchased feed
 - Replacements
 - Health
 - Labour
- **Profit** = Income - Expense



Selection Criteria

$$E_{\text{conomic}} B_{\text{reeding}} I_{\text{ndex}} =$$

Milk_{sub index}
 + Fertility_{sub index}
 + Calving_{sub index}
 + Beef_{sub index}
 + Maintenance_{sub index}
 + Health_{sub index}



Irish Cattle Breeding Federation

Striving to achieve the greatest possible genetic improvement in the national cattle herd for the benefit of Irish farmers, the dairy and beef industries and members. [Learn more about ICBF](#)

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 - [Farm Software Bull Files](#)
 - [Active Bull Lists](#)
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 - [Beef](#)
 - [Dairy](#)
- [Tully Beef Centre](#)
- [GROW](#)
- [Milk Recording](#)
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[Discussion Group Competition Sign Up Form](#)

Publications

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Active Bull Lists

Any comments on the new icbf website can be submitted [here](#)

HerdPlus

Profit through Science

Online Services

User name

Password

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[Where do I get my username and password?](#)

[Experiencing problems - Click Here](#)

[Register your Organization](#)

Bull Search

Search by:

☐ AI Code, Tag, Herd Book

No, ITT

☐ Name or part of name

[Search](#)

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Active Bull Lists

Dairy

[Current List](#)

Beef

[Current List](#)

2010	Autumn 2010 (Pdf , Excel) Support Material: Guide, Review and Analysis	
	Spring 2010 (Pdf , Excel) Support Material: Guide, Review and Analysis	
2009	Autumn 2009 (Excel) All Active Dairy Bulls Autumn 2009 (Excel)	Spring 2009 (Excel file)

Evaluations

- [Main Evaluations Page](#)
- [Beef Results](#)
- [Dairy Results](#)
- [Conversion Equations](#)
- [Active Bull Lists](#)
- [Publication Schedule](#)
- [Notes](#)

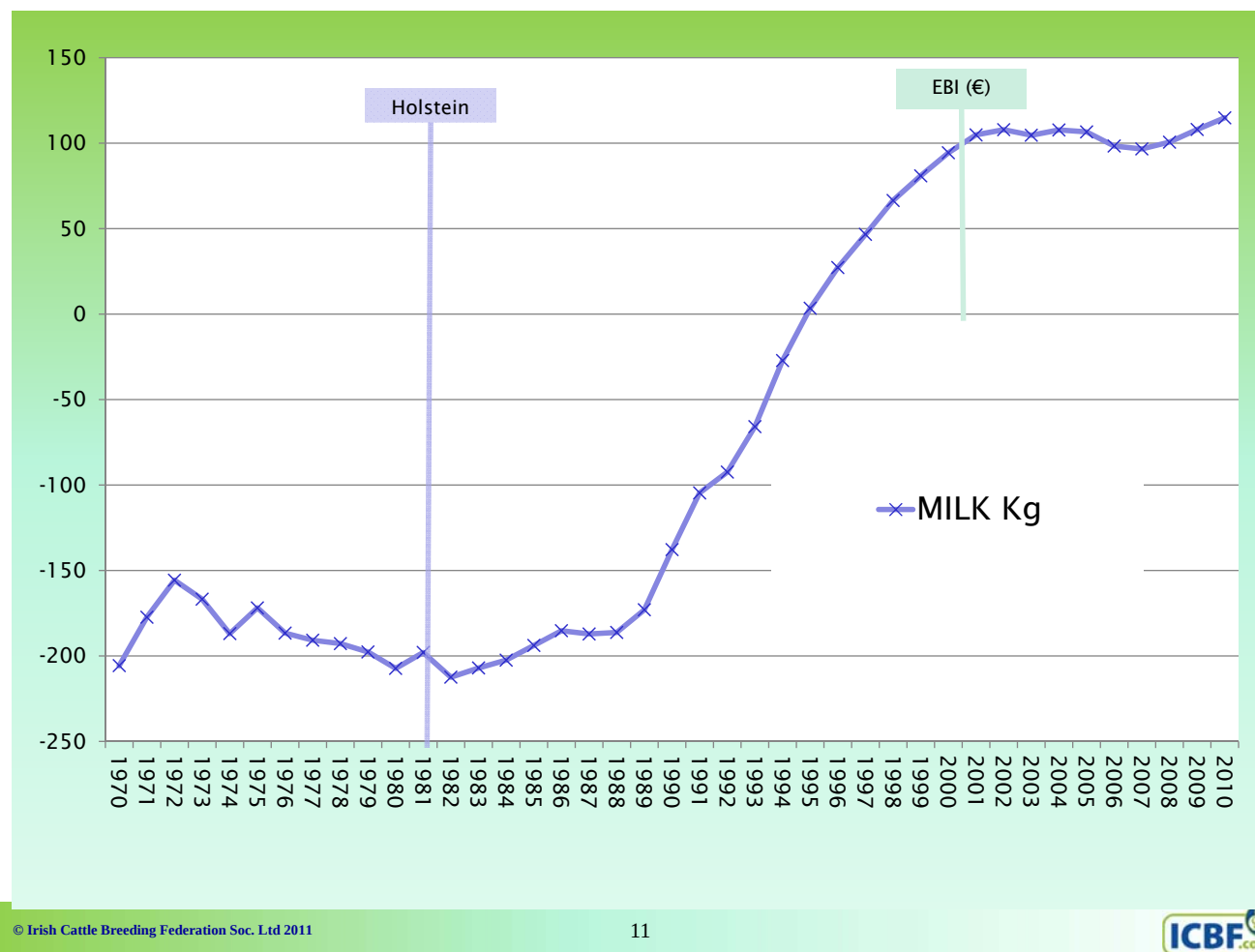


Evaluation Date: Dec 2010

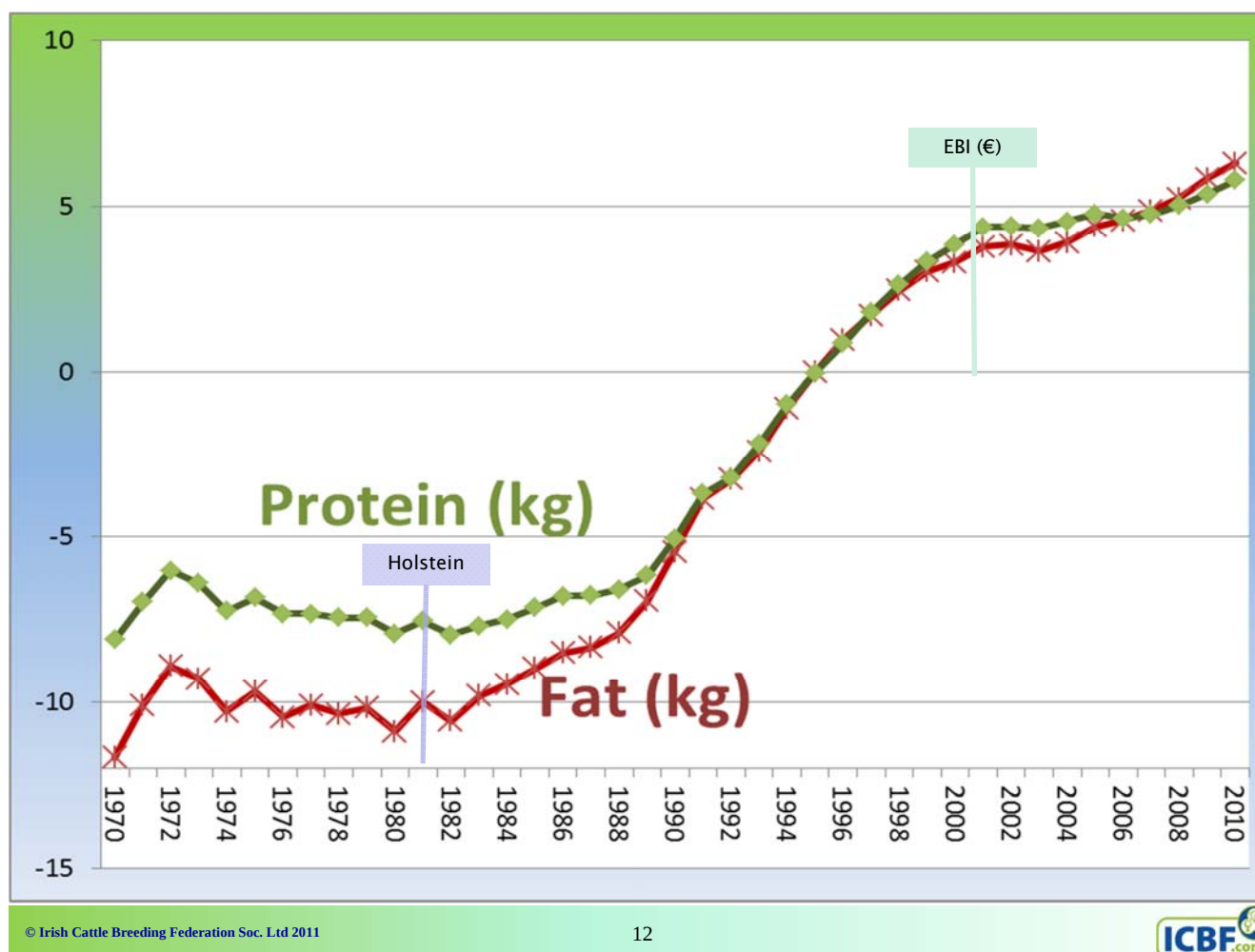
Rank	Tag	Bull Name	Sire	Main Breed	Herd Book Status	HO %	EBI	Rel %	Proof Source	Milk	Fert	Calv	Beef	Maint	Health	Calv Recs	Avail.	Price	Supplier
1	SOK	(IG) SUNNYBANK OMAN	OJI	HO	PED	63	279	55	GS	73	170	32	-7	2	8	1508	Low	20	NCBC
2	KOZ	KEVINSFORT OJI HAZE	OJI	HO	PED	94	264	61	GS	59	159	43	-4	-2	10	330	Medium	20	NCBC
3	MUJ	MORRISHEEN OJI FRANK	OJI	HO	PED	88	262	55	GS	121	108	36	-20	12	4	1380	Low	19	Eurogene/LIC

EBI	=		Milk	+ Fert	+ Calv	+ Beef	+ Maint	+ Health
279	55	GS	73	170	32	-7	2	8
264	61	GS	59	159	43	-4	-2	10
262	55	GS	121	108	36	-20	12	4

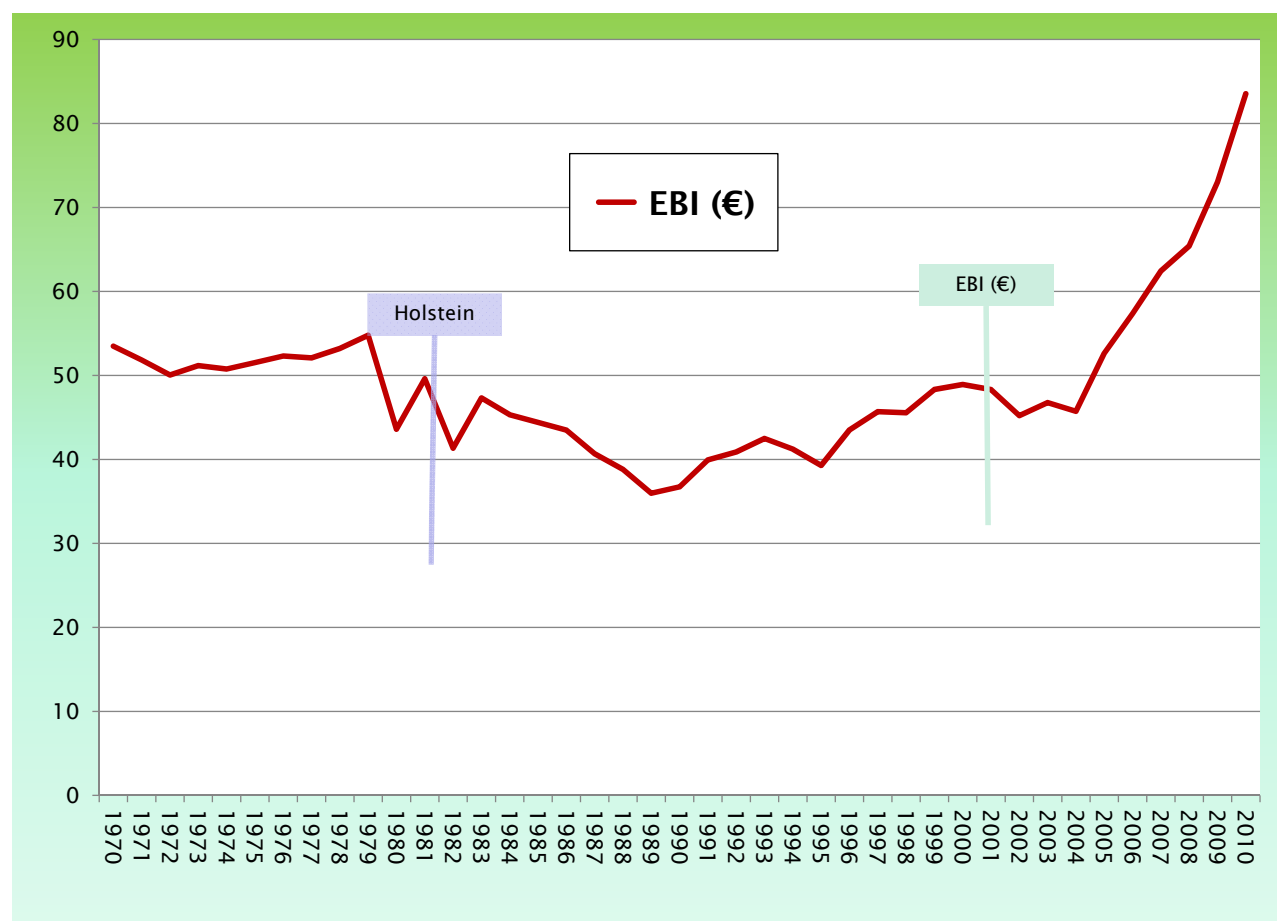
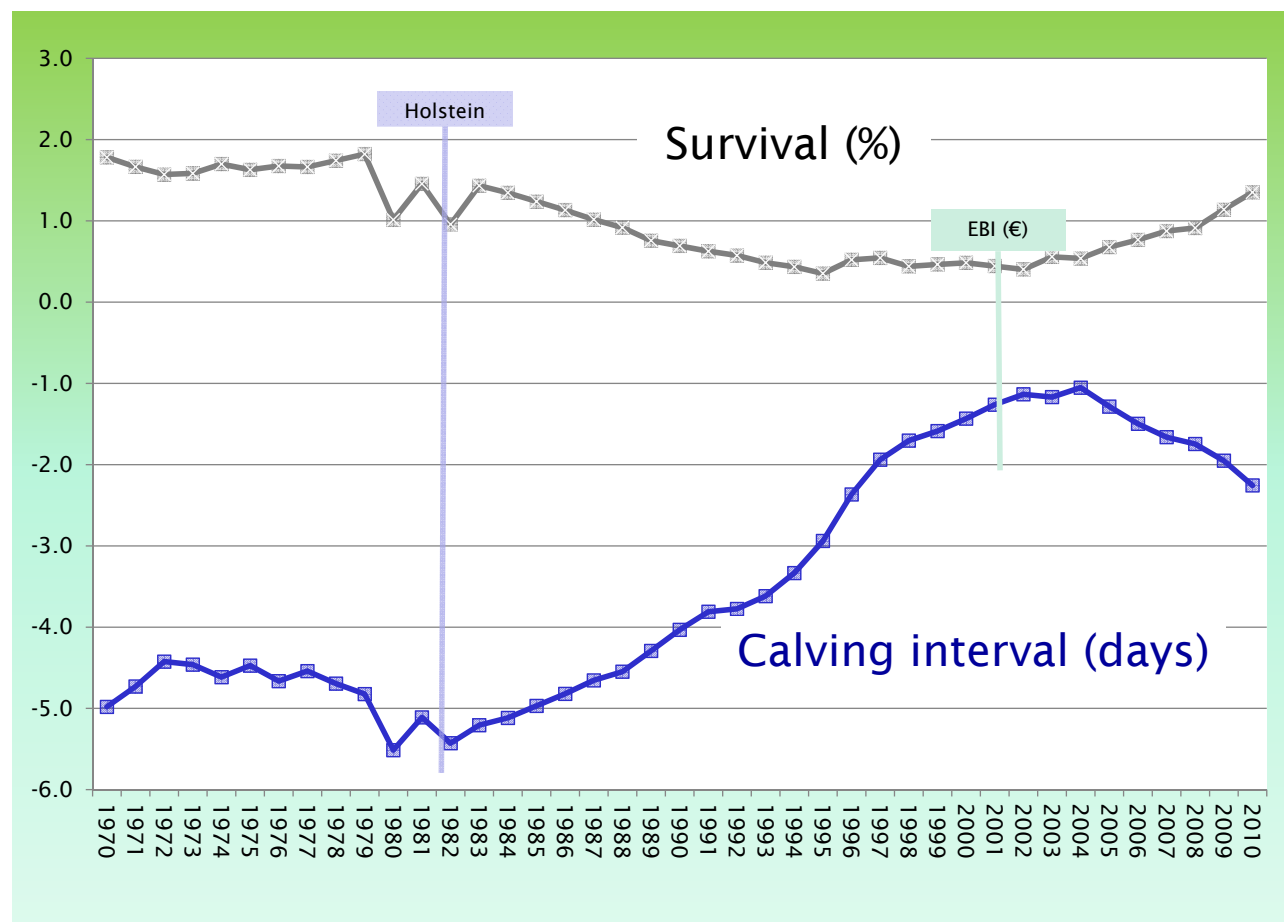
DAIRY CATTLE GENETIC TRENDS – TRAIT AVERAGES FOR DAIRY CALVES BY BIRTH YEAR



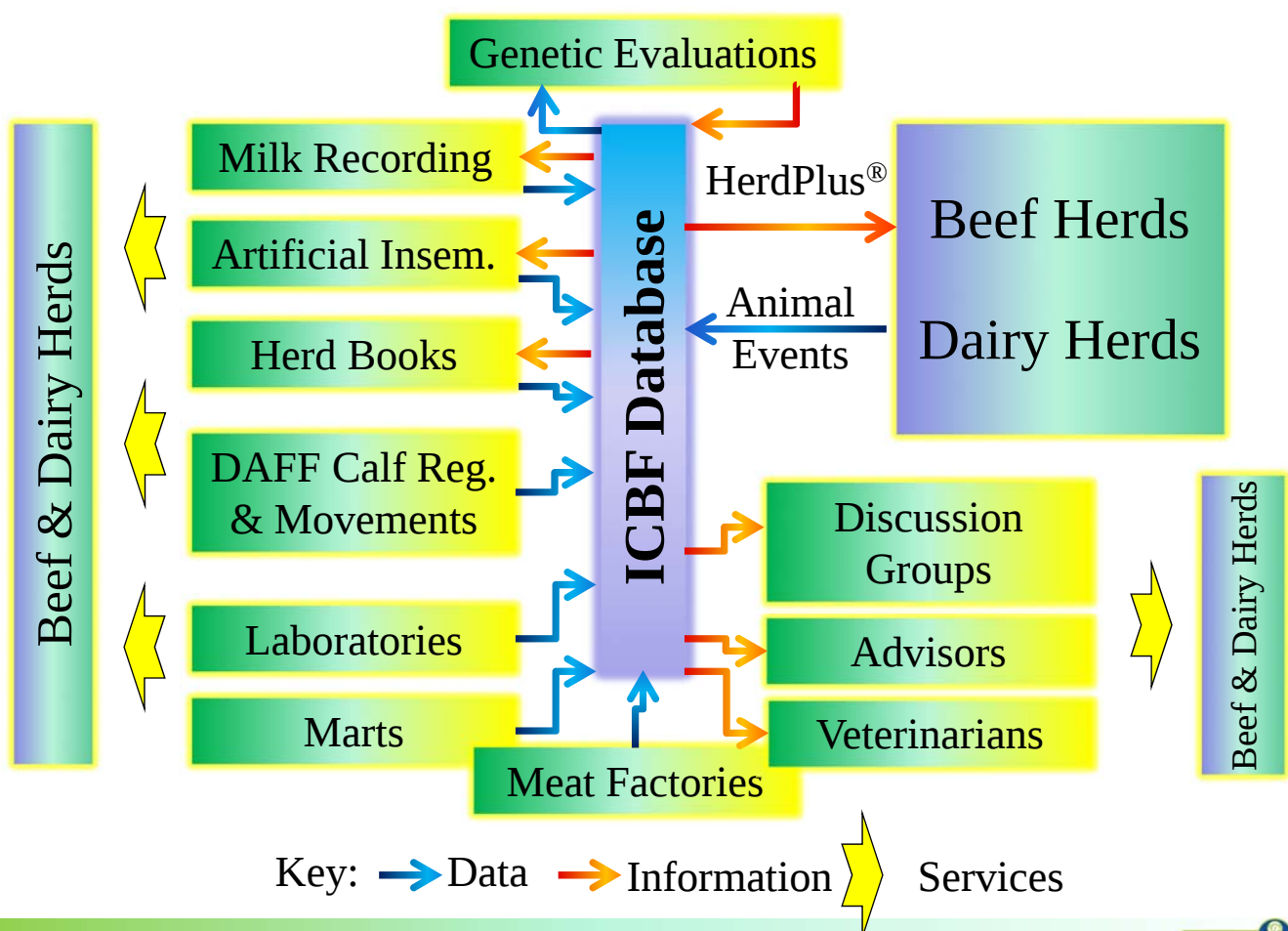
11



12



GENOMIC KEY FOR IRELAND



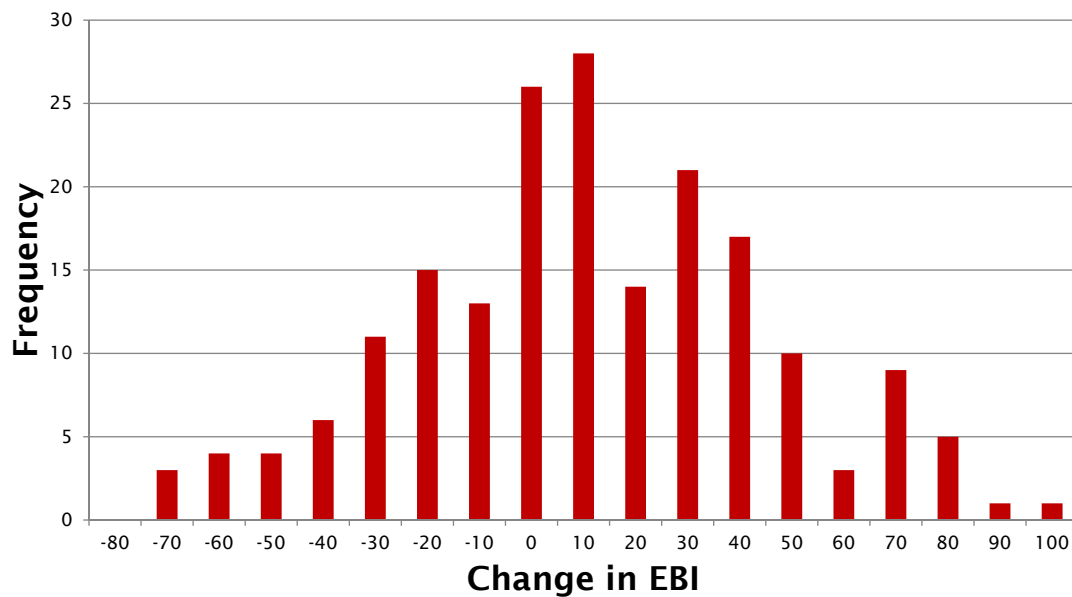
Genomic Key for Ireland

- **Data** - Irish (2009) and Interbull (2010) evaluations for proven AI sires with 50k genotypes - 1,100 in 2009 and 6,500 in 2010
- **Funding** - SFI, Teagasc & ICBF paid for 1,100 genotypes - rest were obtained by exchange
- **Expertise** - Donagh Berry & Francis Kearney - visits, conferences & exchanges
- **Computing** - ICBF & Teagasc
- **Time** - Nov '08 to Feb '09, repeated late 2009 with larger training pop'n.

FARMER COMMUNICATIONS

What to Expect?

Distribution of EBI change from PA for 250 bull calves genotyped in 2010.



www.icbf.com – Dairy Active Bull List

View as Excel

Evaluation Date: Dec 2010

Rank	Tag	Bull Name	Sire	Main Breed	Herd Book Status	HO %	EBI	Rel %	Proof Source	Milk	Fert	Calv	Beef	Maint	Health	Calv Recs	Avail.	Price	Supplier
1	SOK	(IG) SUNNYBANK OMAN	OJI	HO	PED	63	279	5	GS	73	170	32	-7	2	8	1508	Low	20	NCBC
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Main Breed	Herd Book Status	HO %	EBI	Rel %	Proof Source	Milk	Fert	Calv	Beef
O					GS	73	170	32	-7
O					GS	59	159	43	-4
O					GS	121	108	36	-20

DP–IRL daughter proven in Ireland

DP–INT daughter proven internationally

GS genomic selection

Advice to Farmers

- Stick to bulls on ICBF Active Bull List & use a team.
- No shortage of choice.
 - Breed, milk kg, type, price....
- Use ICBF Sire Advice facility.
 - Help select bulls and/or mate cows.
- Use enough AI straws.
 - 1.5 straws for each cow & 1.0 straws for each heifer.
- Target 40 dairy heifers per 100 cows.

RESPONSE

AI Industry Response

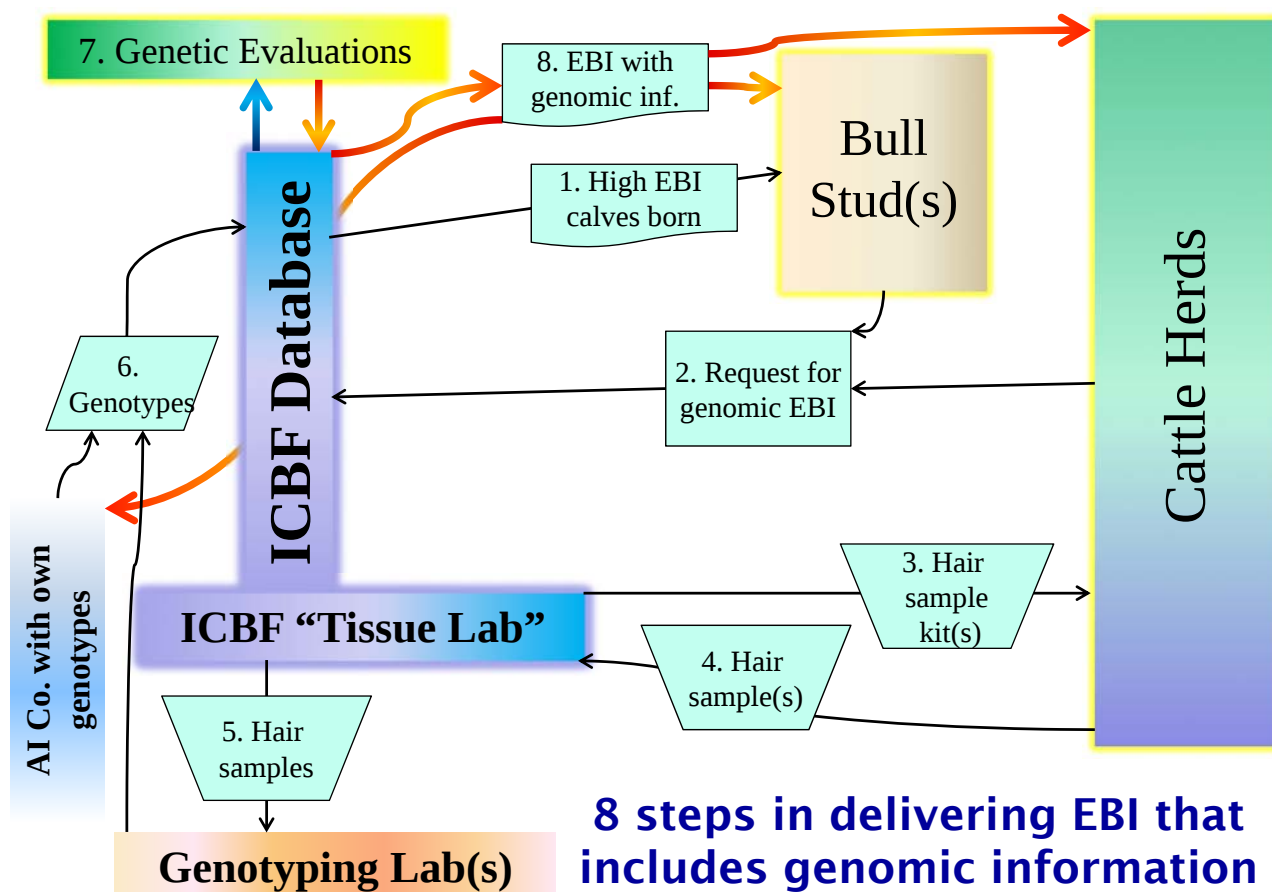
- 2009
 - Genotyped bulls in PT pipeline
 - Started genotyping bull calves before selection
 - Offered GS bulls at lower price
 - Promoted teams of GS bulls
- 2010
 - Increased use and price of GS bulls
 - IBR outbreak in young bulls at main stud
 - Reduced bulls in PT
 - Paying more for bull calves

AI Industry Response

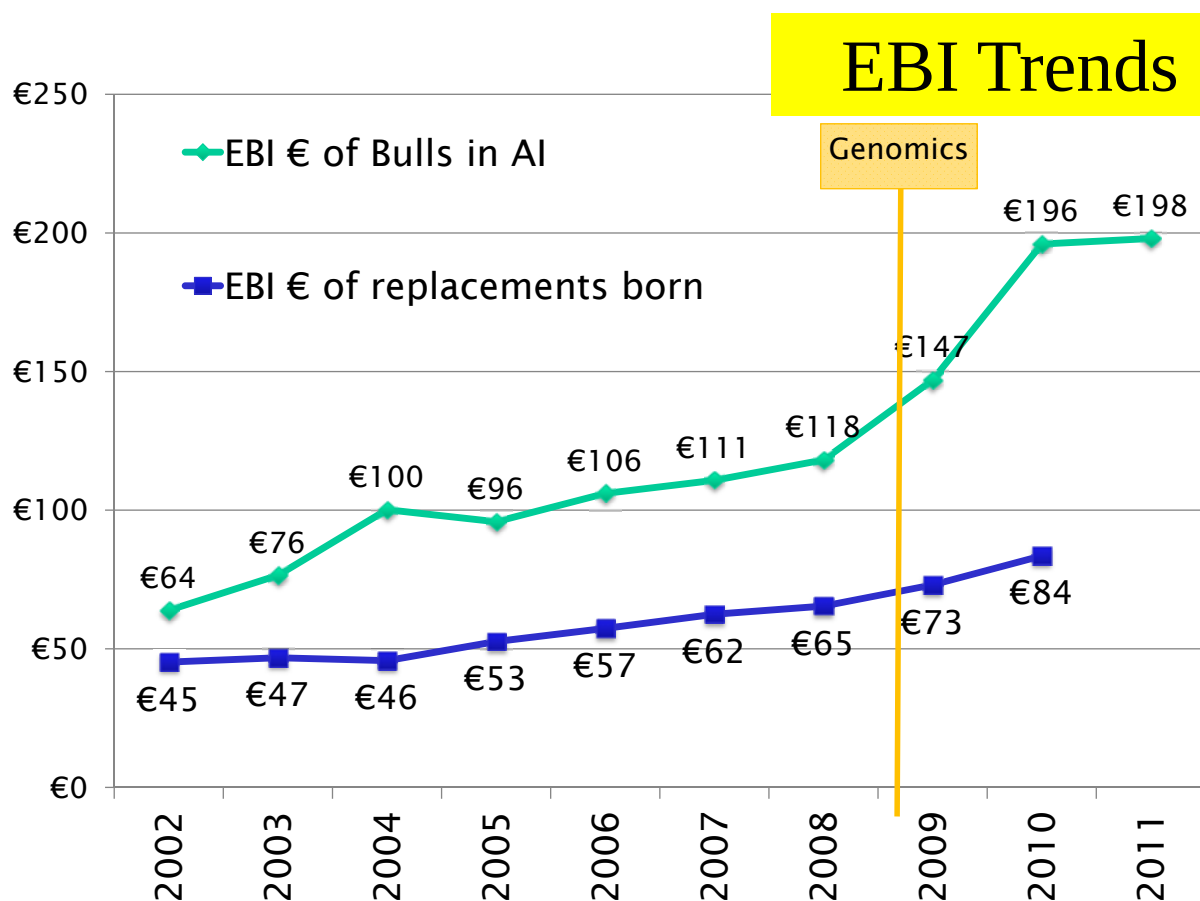
- 2011
 - IBR outbreak in main stud
 - Increased genotyping of young bulls
 - Reviewing Design

Farmer Response

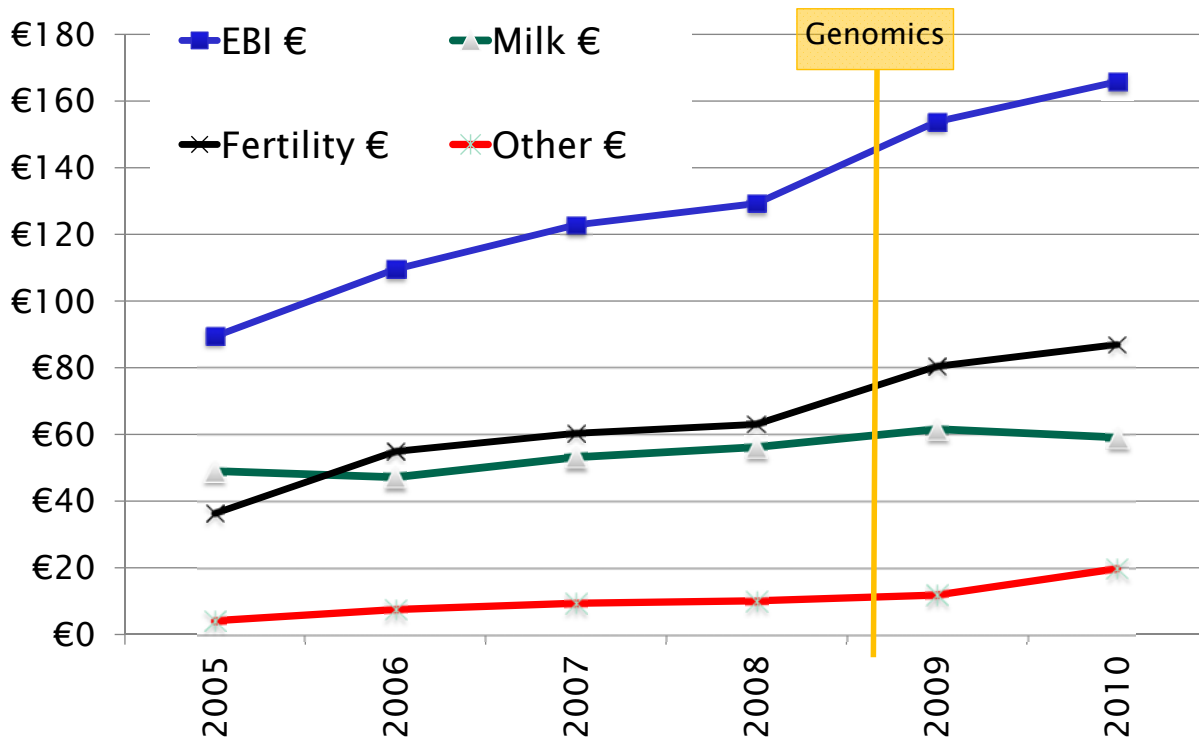
	2009			2010		
Proof type	% Use	Bulls /hrd	EBI (Rel)	% Use	Bulls /hrd	EBI (Rel)
DP-IRL	37	2.7	120(86)	25	3	146(76)
DP-INT	29	3	133(56)	34	3	155(47)
GS	34	4	179(55)	40	4	218(56)



GENETIC TRENDS



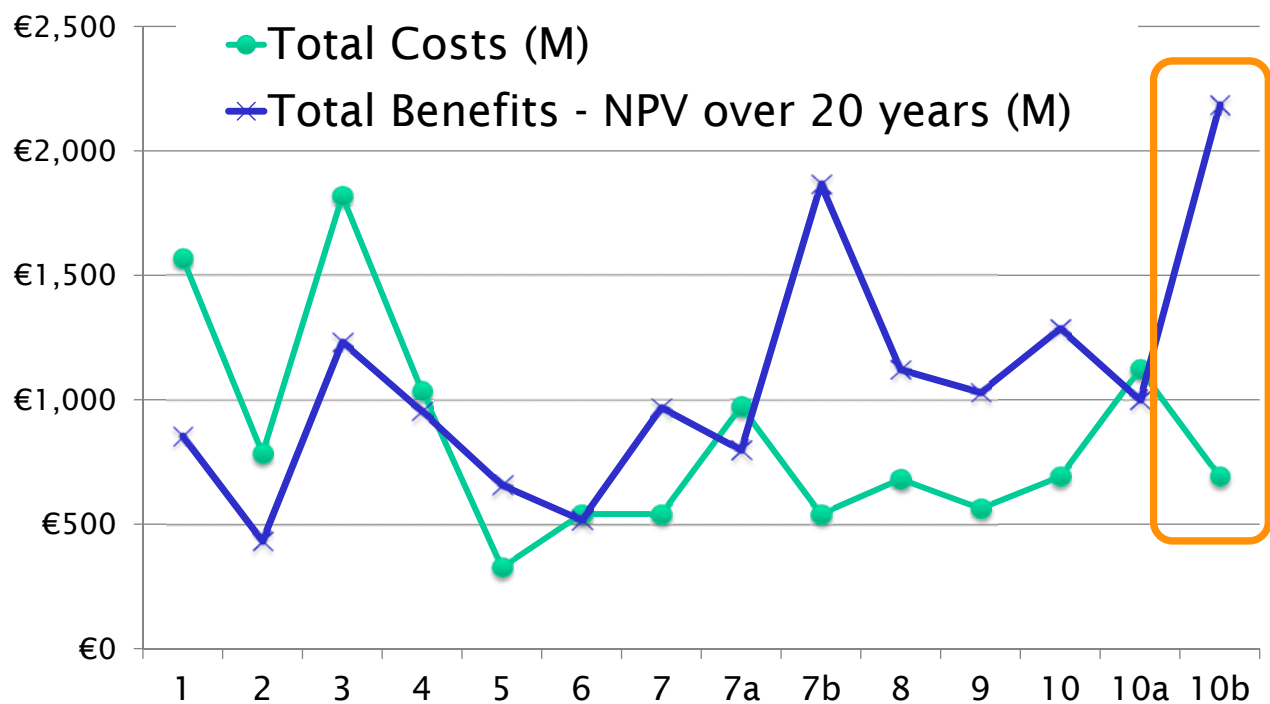
EBI and economic sub-indexes for dairy bulls entering progeny test in last six years.



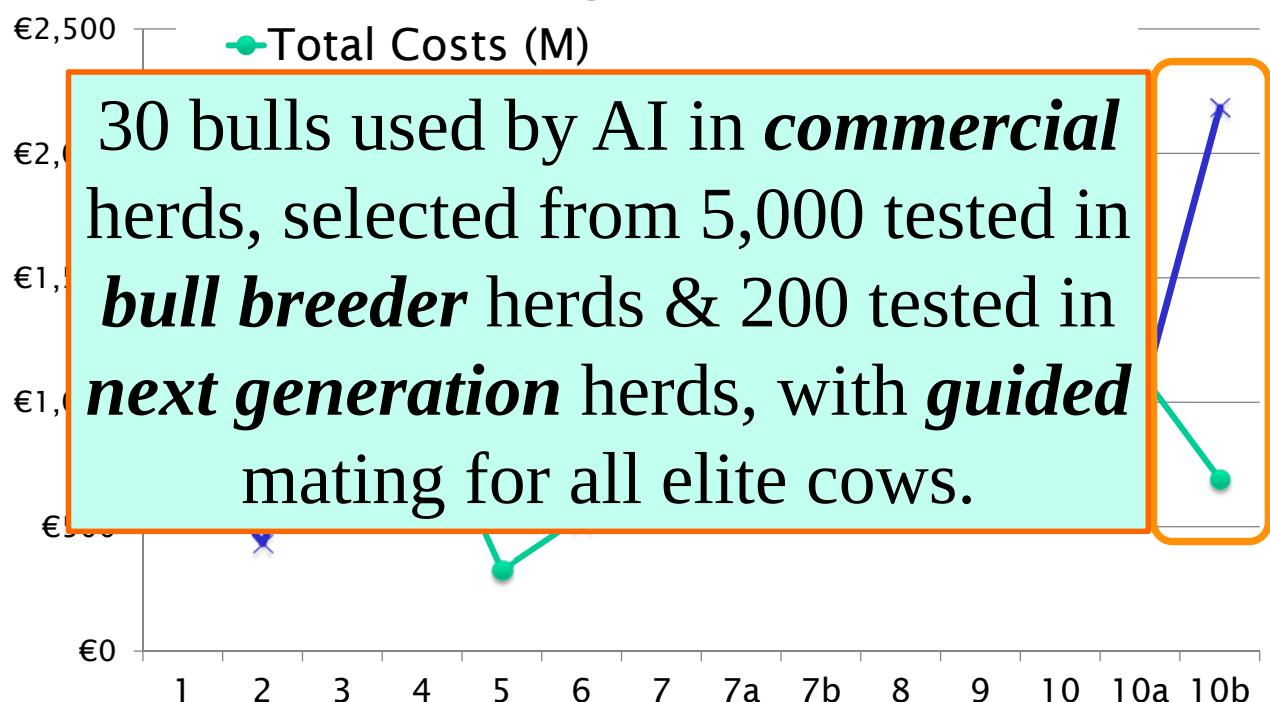
GENE IRELAND® - Research in 2010

- Four areas:
 - Breeding programs to exploit genomics in Ireland - McHugh.
 - Cost & benefit analysis of the program options - Amer.
 - Directed advice for Bull Breeders - McParland.
 - Dairy cattle for use in research - Teagasc Moorepark.

Costs & benefits for different dairy breeding schemes



Costs & benefits for different dairy breeding schemes



Commercial Herds.

- Target: To develop a highly profitable National dairy herd.
- Objectives for these herds:
 - Basis for a profitable Irish dairy industry.
 - To collect data needed to facilitate best practice for farm management, animal health and cattle breeding.
- Operations:
 - Independent businesses
 - Service providers (AI, Milk Recording, Herd Book, Advisory, Veterinarians) using ICBF database facility to access relevant comparative information.

Bull Breeder Herds.

- Target: - establish 100,000 high EBI cows on 1,000 farms, with all cows genotyped within 5 years.
- Objective:
 - Provide data for genomic predictions through full recording of performance and genotyping.
 - Provide elite animals for breeding program through targeted matings using selected sires.
 - Use year one GS bulls to provide initial “progeny test”.
- Operations:
 - ICBF providing targeted breeding advice, AI companies providing semen and purchasing elite bulls.

Next generation herds.

- Target: - establish 1,000 elite high EBI cows over 5 research sites.
- Objectives:
 - Validate and develop EBI New traits, e.g., mastitis, lameness, feed efficiency....
 - Provide elite animals for breeding program.
 - Conduct management research using relevant animal genetics
- Operations.
 - Replacements from Bull Breeder Herds
 - Research Centre (Teagasc) providing “day-to-day” and research agenda.
- Ownership (of cows).
 - Research organisation.

Summary

- Irish cattle farmers want to breed more profitable cattle.
- Ireland now has a world-class system for finding cattle with the greatest genetic potential to increase profits.
- Genomics is fundamentally altering the way we breed dairy cattle.
- Research has become an integral part of commercial dairy farming.

ICAR 2012 CONFERENCE

**CORK
IRELAND**

Mon 28th May
- Fri 1st June 2012



www.icar2012.ie