

Irish Cattle Breeding Infrastructure

Presentation to Board of CRV
26th August 2010
Brian Wickham & Andrew Cromie



Content

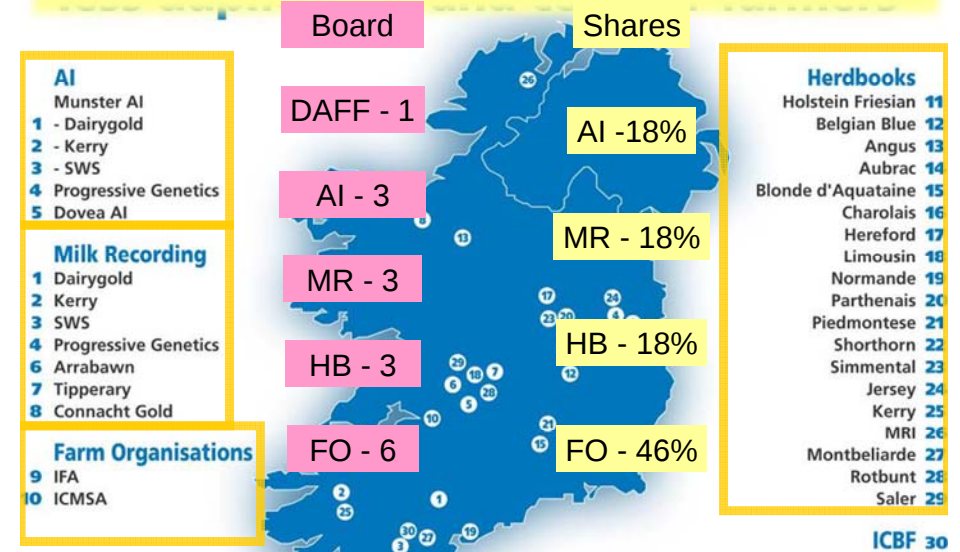
- Background
- Data & Information Sharing
- Genetic Evaluations
- Breeding Scheme Design
- Genomics
 - Progress
 - List
 - IGenoP
- Funding & Benefits
- Conclusions

Background

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**

MEMBERS, BOARD & SHARES - ICBF



Stakeholders in cattle breeding control decision making.

Data & information sharing

Data & Information Sharing Agreement

- Contributors retain ownership
- Farm data through "Animal Events"
- Electronic sharing of data collected
- Data for research
- Integrated genetic evaluations
- Herd owner controls access
- Information for service providers
- HerdPlus® - complete information for herd owner
- User-pays & full cost recovery

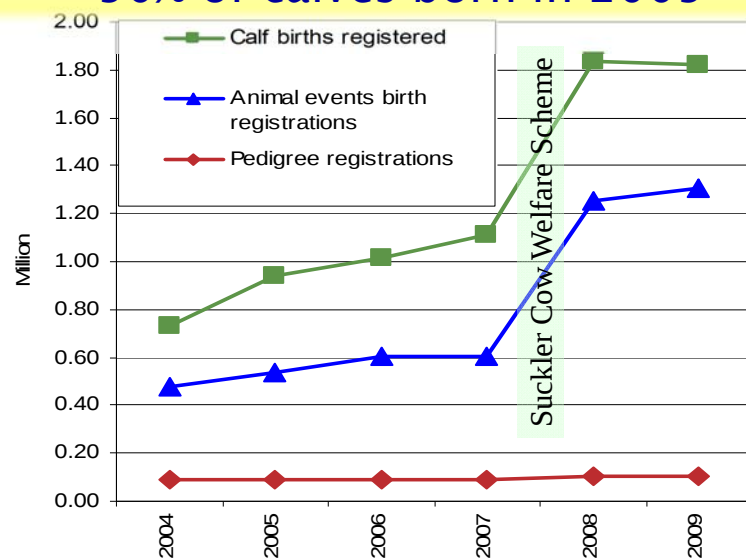
Database – single source – without duplication

Source of data	Type of data
Farms	Animal events – birth, calving, weights, docility,
DAFF – official system	Registrations, movements, deaths, exports ...
Meat Factories	Slaughter (date, weight, grade ...), Images
Marts – cattle sales	Sale (date, weight, price ...)
AI Handhelds	Insemination (date, sire)
Milk Recording	Milk weight
Laboratories & Milk Processors	Milk supplied, Milk composition, disease test results, genotypes
Linear scoring	Weights, scores – beef & dairy
Genetic evaluations	Breeding values, reliabilities, indexes ...

Database Information – single source – many users

Customers	Type of Information
Service providers: - Milk recording - Herd Book - AI Stud & Field - Advisory - Veterinarians - Milk processors - Researchers	• Customer profiles • Service details • Genetic evaluations • Herd Books • Discussion Groups & Farmer Reports • Elite animals • Research results • Active AI bull lists • Raw data files for research
Farmers direct	• HerdPlus®- genetic evaluations, reports • GROW®- reports • GENÉ IRELAND®- progeny test
General public: www.icbf.com	• Statistics, Reports, Publications ... • Genetic Evaluations

Growth of Participation – 90% of calves born in 2009



Breeding objectives & genetic evaluations

Beef Genetic Evaluations

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- [Fast Weekly Reports](#)
- [Cattle Statistics](#)
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Learn more about ICBF

- [Contact Information](#)
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ICBF Website
www.icbf.com

Any comments on the new icbf website can be submitted here

bull search

Online Services

User name

Password

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Where do I get my username and password?
Experiencing problems - Click Here

Bull Search

Search by:

☐ AI Code, Tag, Herd Book

☐ Name

☐ Name or part of name

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Beef Bull Euro-Star Evaluation

ICBF Genetic Evaluations Service					
Euro-Star Rating (ICBF, April 2010)					
AI Code:	CF52	Breed:	CH (100%)	Sire:	HERMES / HME
Animal Name:	DOONALLY NEW	Owner:	NATIONAL CATTLE BREEDING CNTR	Dam:	INTRUSE / 7193100567
Date of Birth:	18-JAN-1997	Date of Evaluation:	April 2010	MGS:	CAMPAGNARD / 1887109836
National ID:		Euro-star Index		Calving Traits	
International ID:	CHLFRAM007197126709	Linear Type		Pedigree	
				Weaning	
				Beef Carcass	
				Milk	
% Rank	Star Rating (within breed)	Index and Traits	Euro-Value	% Rank	% Rank
94%	★★★★★	Suckler Beef Value (SBV)	€131	94%	94%
98%	★★★★★	Weanling Export	€108	99%	99%
99%	★★★★★	Beef Carcass	€176	99%	99%
1%	★	Daughter Fertility	€-81	1%	1%
1%	★	Daughter Milk	€-121	1%	1%
Other Key Traits					
11%	★	Calving Difficulty (% 3 or 4)	11.28%	5%	5%
99%	★★★★★	Gestation Length (Days)	.79 Day(s)	78%	78%
92%	★★★★★	Dockity (1-5 score)	0.14	93%	93%

Data Reliability: 40% - 60% = Average

20 - 40% = Below Average

< 20% = Poor

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Dairy Genetic Evaluations

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bull search

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Bull Search

Search by:

☐ AI Code, Tag, Herd Book

☐ Name

☐ Name or part of name

[Search](#)

Dairy Bull - EBI Evaluation

Code:		Owner:	NATIONAL CATTLE BREEDING CNTR	Dam:	BODE 030 / 0020421638
Animal Name:	GRATEE MERRET	Date of Birth:	01-SEP-1992	Date of Evaluation:	April 2010
National ID:		MGS:	SIR C VALOR / 6501811754		
International ID:	HOLDEUM001021231601	EBI Summary		Milk	
		Health		Type	
				Pedigree	
				Prev Eval	

Index	Euro	Rel	Percentile	Overall Index – EBI in €
EBI	98	99%		
Milk Sub Index	58	99%		
Fertility Sub Index	26	99%		
Calving Sub Index	20	99%		
Beef Sub Index	-8	99%		
Health Sub Index	-3	99%		
Maintenance Sub Index	4	99%		

Index	PTA	Rel	Percentile	Calving Sub Index	PTA	Rel	Percentile	Key traits phenotype units
Dir. Calv Diff. (%)	3.32	99%						
Mat. Calv Diff. (%)	10.02	99%						
Gest Len (Days)	-2.14	99%						
Calf Mort (%)	-0.65	99%						

Breeding scheme design - GENE IRELAND®



GENE IRELAND®

- **Goal:** to optimise rates of genetic gain (in € profit) in Irish dairy (& beef) herd
- Dairy – 100 bulls, with 100 daughters per year
- Multiple breeding companies supply test bulls
- ICBF contracts herds & allocates semen from all bulls
- Multiple field service providers service herds – deliver semen, inseminate cows
- ICBF administers incentives, co-ordinates all data collection



GENE IRELAND®

- Under review – genomics & disease
- Genomics
 - **Research & retraining** required into future – 100 bulls, 100 dtrs, 1,200 herds
 - **Dedicated next generation research herd** to: Monitor trends in traits not measured, & optimise farm management advice
- Disease
 - Reduce risk



Genomics



Genomics – Progress so far

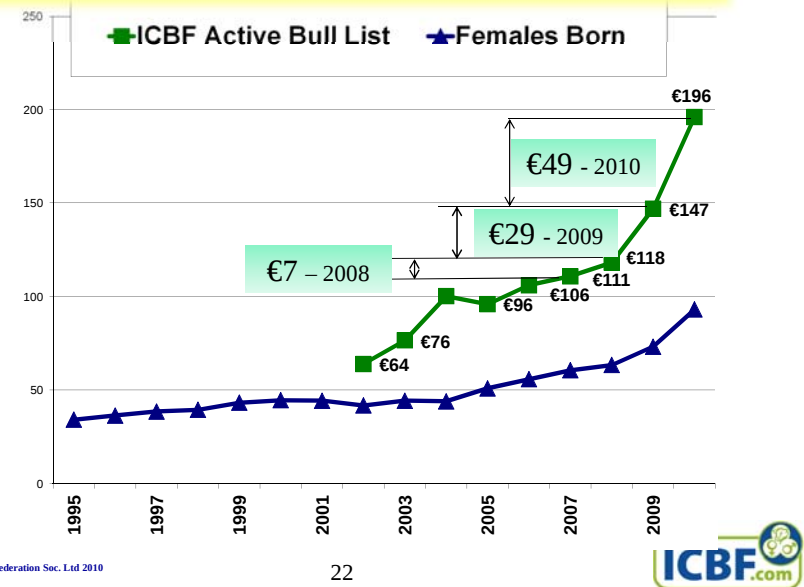
- Collaboration with Teagasc, International partners & AI Industry
- Jan 2009 first implemented for HF, training pop'n 1,100 bulls
- 35% of AI matings spring 2009 from GS bulls & large increase in EBI
- Jan 2010 training pop'n 5,500 bulls
- 40% AI matings spring 2010 from GS bulls & larger increase in EBI

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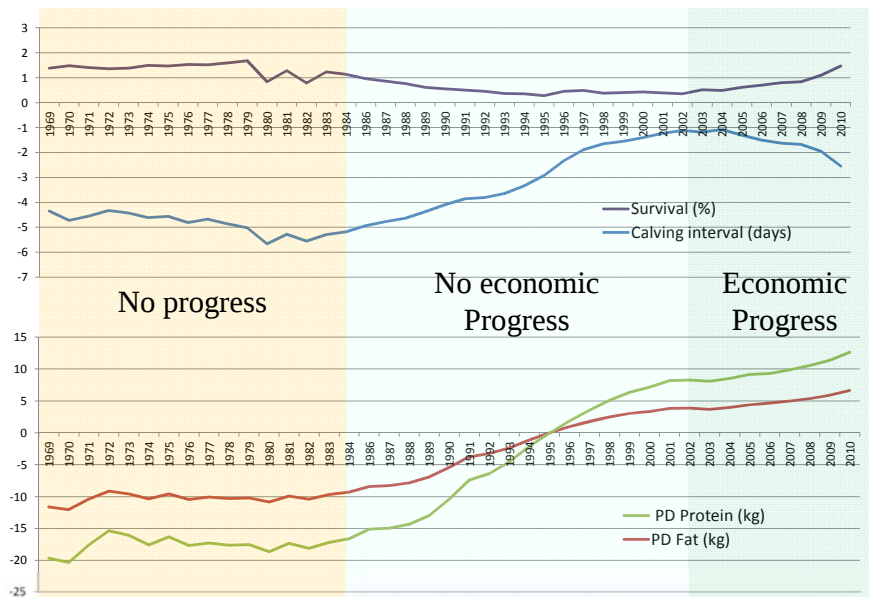
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Genetic trends - EBI

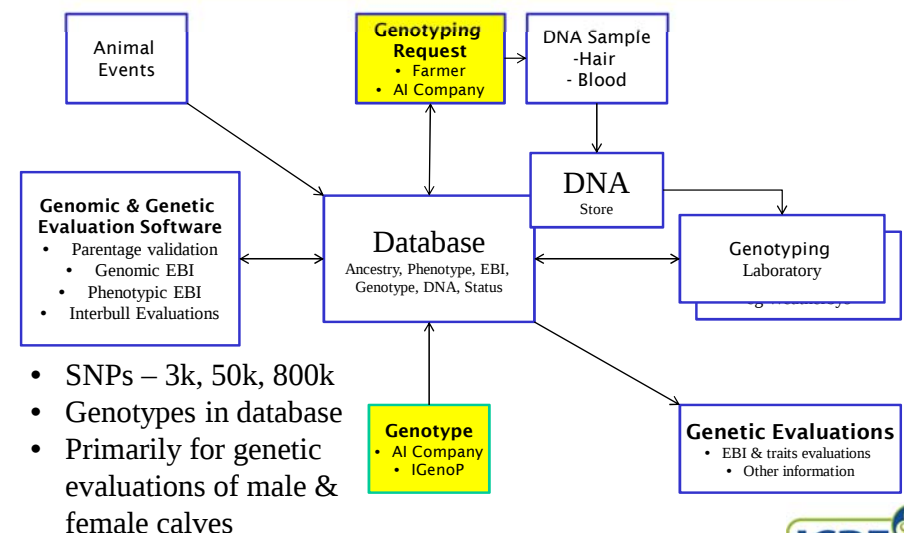


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Genetic change – females by year of birth

Genomic Services

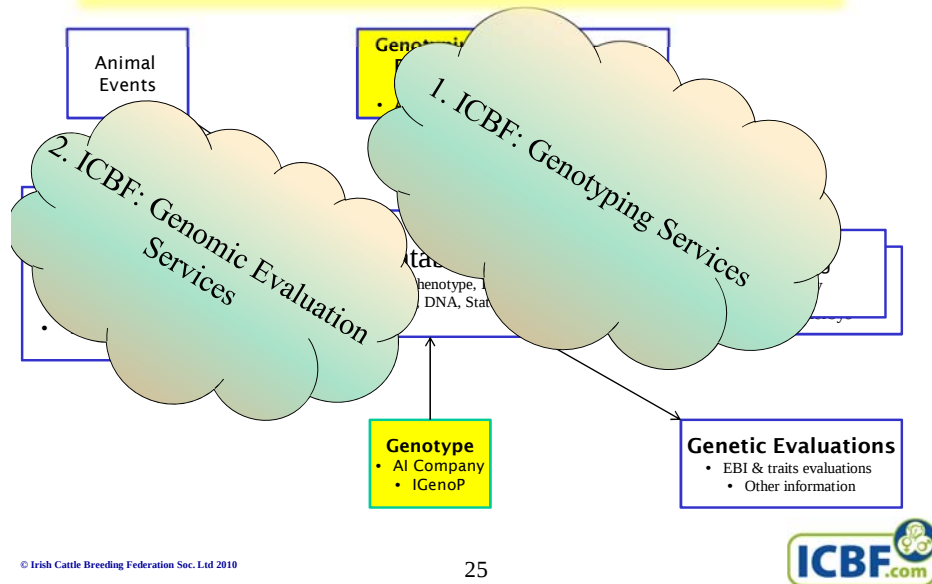


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Genomic Services



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The List

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Objective of The List

- To facilitate collaboration between countries on genomic selection:
 - Increase the accuracy of national genomic evaluations by increasing the training population
 - Avoid/reduce duplication of genotyping and save money
- Important for countries that have genotypes and those planning to genotype

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Clarity

- Participation in The List does NOT mean sharing of genotypes
- Swapping of genotypes is done through (bilateral) agreements between individual countries
- Participation is open to all
- Will be hosted by Interbull Centre

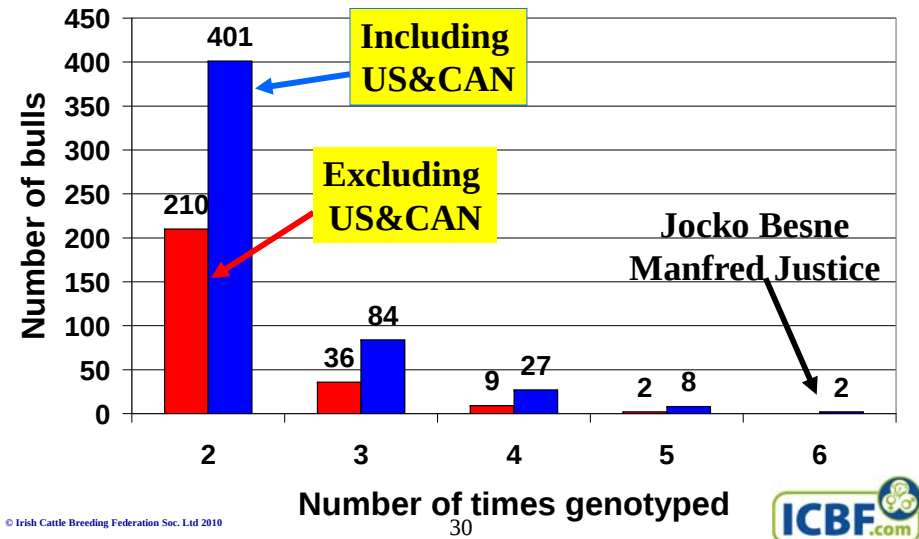
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The List

ITB_ID	UK	BEL	RSA	IRL	CHE	POL	ITA	ESP	ISR	JPN	AUS	NZL_LIC	US CAN	MACE
HOLARGM000000240478	0	0	0	0	0	0	0	0	0	0	0	0	1	0
HOLARGM000000241115	0	0	0	0	0	0	0	0	0	0	0	0	1	0
HOLARGM000000241598	0	0	0	0	0	0	0	0	0	0	0	0	1	0
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Genotyped with 50K	-	-	-	1,397	1,127	1,363	2,349	-	912	2,420	2,209	1,824	17,541	22,898
Genotypes planned	202	184	47	-	-	-	888	5,551	-	-	-	-	-	-
Total bulls 36,898		Total bulls with genotypes - 30,643			Redundant genotypes - 692			Bulls genotyped more than once - 522						

Number of times genotyped



IGenoP

Motivation

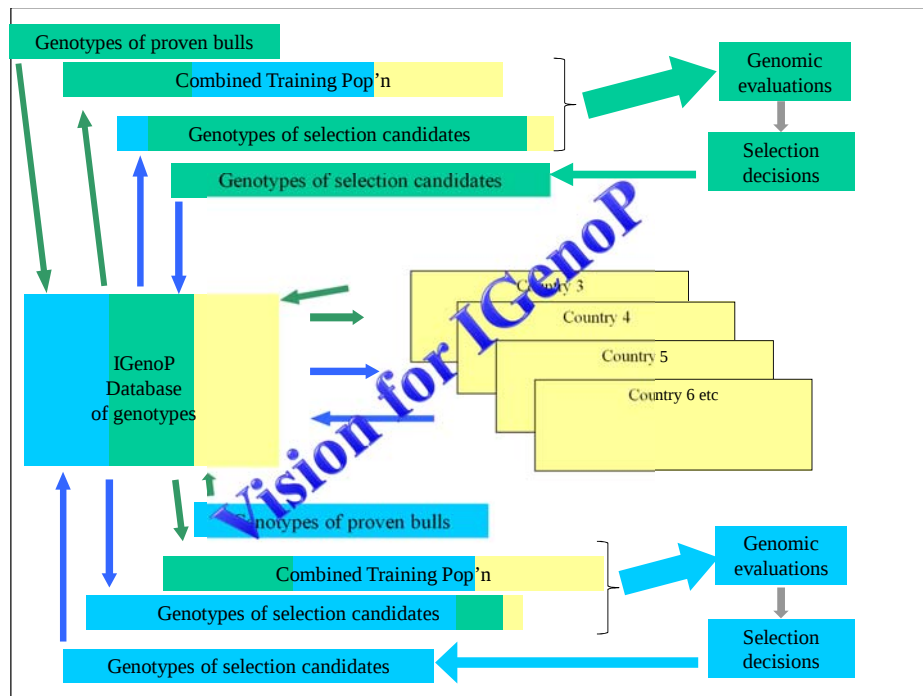
- Countries want to;
 - Provide genomic indexes in their base & scale.
 - Evaluate candidates from other countries.
 - Ensure their evaluation system is free from bias due to genomic pre-selection.
 - Provide an efficient service to its industry.

IGenoP – Getting started

- Under IGenoP this would be achieved through;
 - Establishment of an IGenoP database.
 - Genotype proven bulls within countries – avoid duplication.
 - Pool genotypes, access MACE proofs and develop genomic key for that country.
 - Repeat as required.

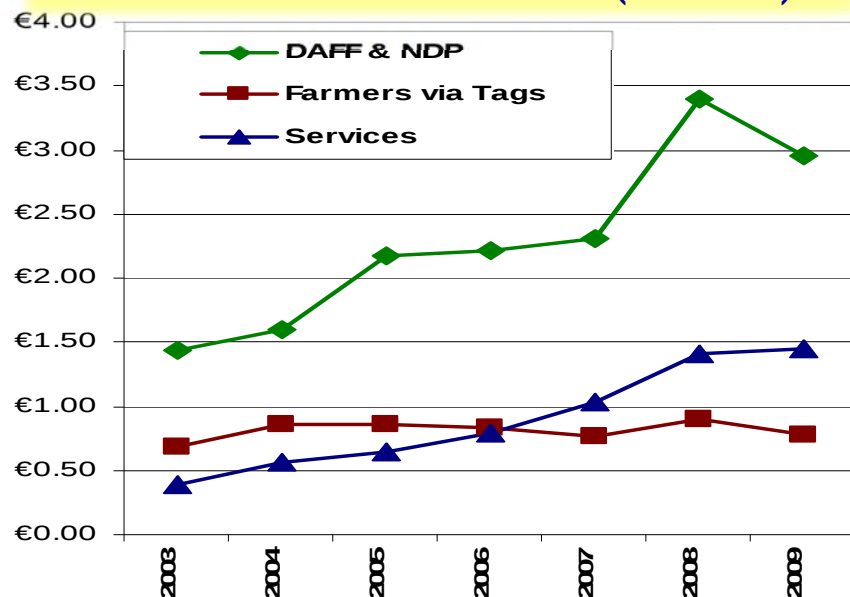
IGenoP – Moving forward

- Genotypes for all selection candidates stored on IGenoP database.
 - Genotypes sent directly from co-operating laboratories.
- Each country has access to all genotypes for identification of superior animals for their country.



Funding & Benefits

ICBF INCOME SOURCES (million)



Benefits to Stakeholders

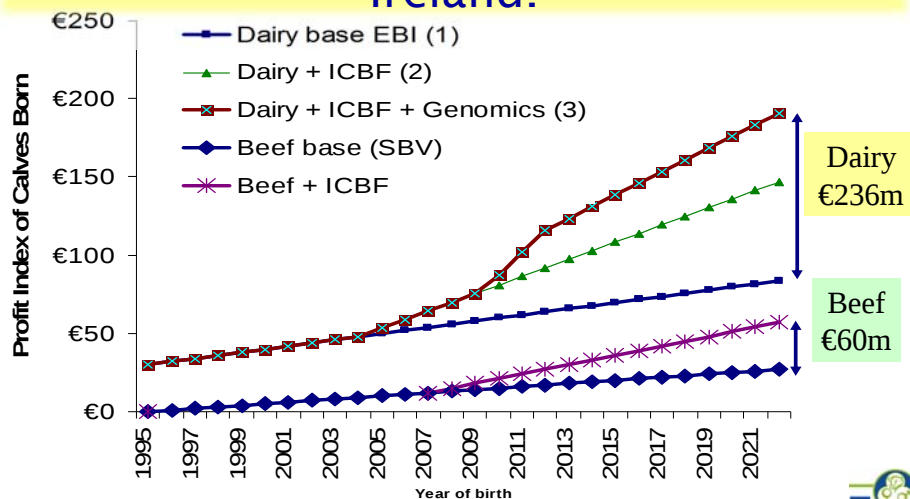
- State
 - cost savings (€1.35m)
 - taxation (€2.27m)
 - research, education, knowledge transfer
- Community
 - Industry - processors, suppliers
 - Consumers
 - Society
- Farmers
 - Service users - now & future
 - Non users of services - now & future
- Breeding Industry

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Projected Impact of ICBF on Genetic Gain of Dairy & Beef Calves Born in Ireland.



Conclusions

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Conclusions

- Animal breeding is a unique and powerful tool for improving the profitability of cattle farming in Ireland.
- Irish animal breeding has been transformed through a unique partnership between farmers, the breeding industry and DAFF.
- The ICBF database is the key repository for data and source of information for Ireland's breeding industry.
- Ireland's genetic evaluation system is focused on identifying the most profitable animals worldwide for use by Irish farmers.
- Genomic technologies are enabling more rapid genetic progress through a significant change in breeding scheme design for the benefit of Irish farmers.
- International collaboration is a key element of our strategy for delivering improved profits to Irish farmers.

