



IRISH CATTLE BREEDING FEDERATION

Animal Recording: Past – Present – Future.

Brian Wickham PhD

S A Stud Book / Standard Bank
Centenary Symposium
19th October 2005

Contents

Past

Present

Future

*A perspective based on recent
experiences in Ireland*

Animal Recording for Genetic Improvement

Data collection

Data storage

**Information for
breeding decisions**

**Genetic
evaluation**

**Breeding
scheme
design**

Ireland - Past (pre-1998)

- Data – many organisations
 - **Identification** – 19 “systems” for Holsteins, few sires identified, National ID & CMMS just started
 - **Performance** – milk recording (33%), reproduction (nil), beef (1%)
 - **Databases** – 8 milk recording, 8 AI, 12 herd books, 4 genetic evaluation, ...
- Genetic Evaluations - DAF
 - **Dairy** – within breed (Holsteins only) for production & type traits
 - **Beef** – three different systems – performance test station, progeny test station and pedigree herds – limited range of traits – mix of within & across breeds
- Breeding Schemes – AI, Breeders, Importers
 - **Dairy & Beef** – heavy reliance on imports of bulls and semen

Ireland - Past (pre-1998)

- Data – many organisations

- **Identification** – 19 “systems” for Holsteins, few sires identified,

- **Lack of an integrated database was identified as the main factor limiting the genetic improvement of Irish cattle.**

- Gen

-

-

- Bre

-

- A new organisation was called for and established.**

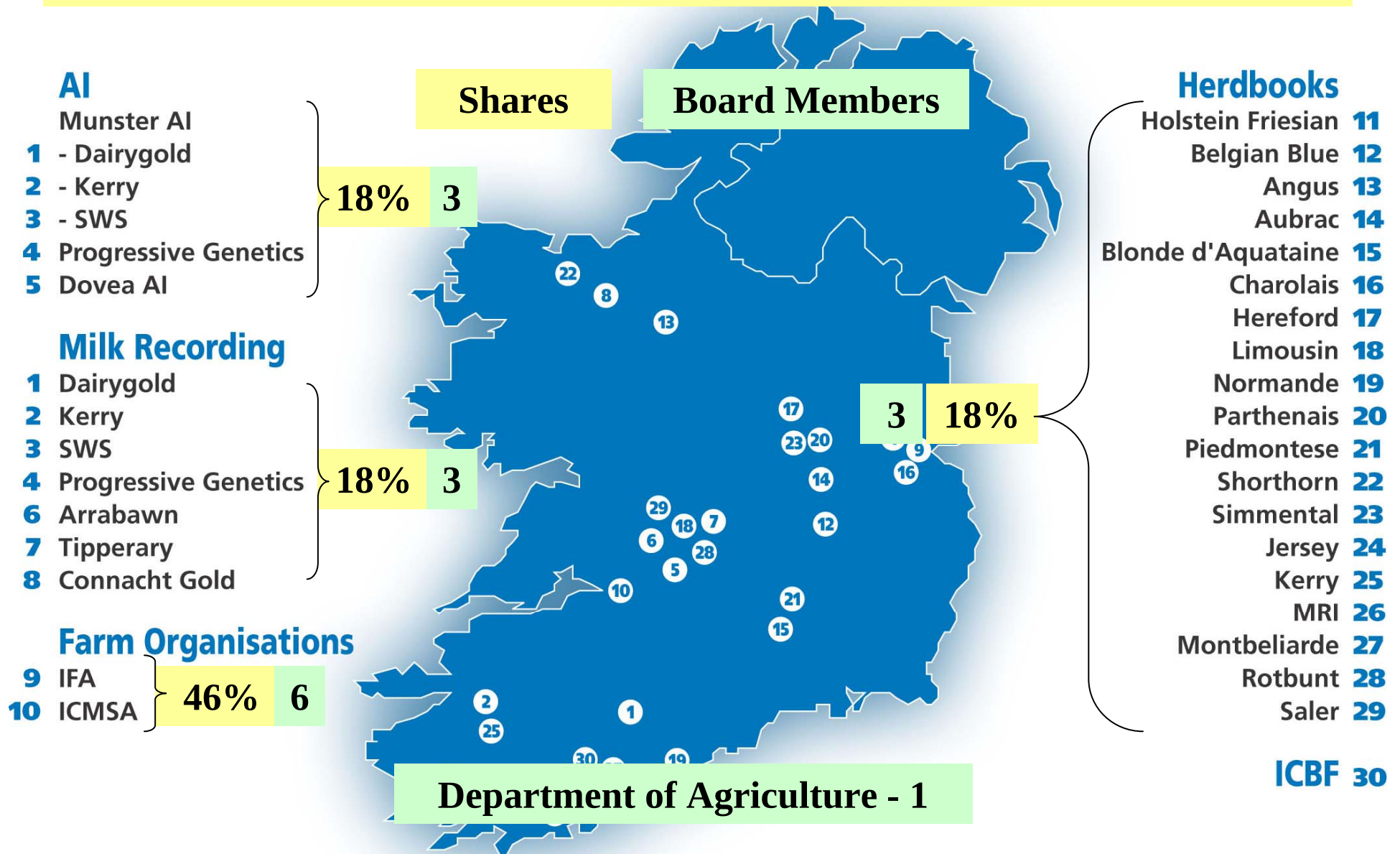
Mission of ICBF

To ensure that Irish Farmers have the **Best (€) Cattle in the World** for dairy and beef production.

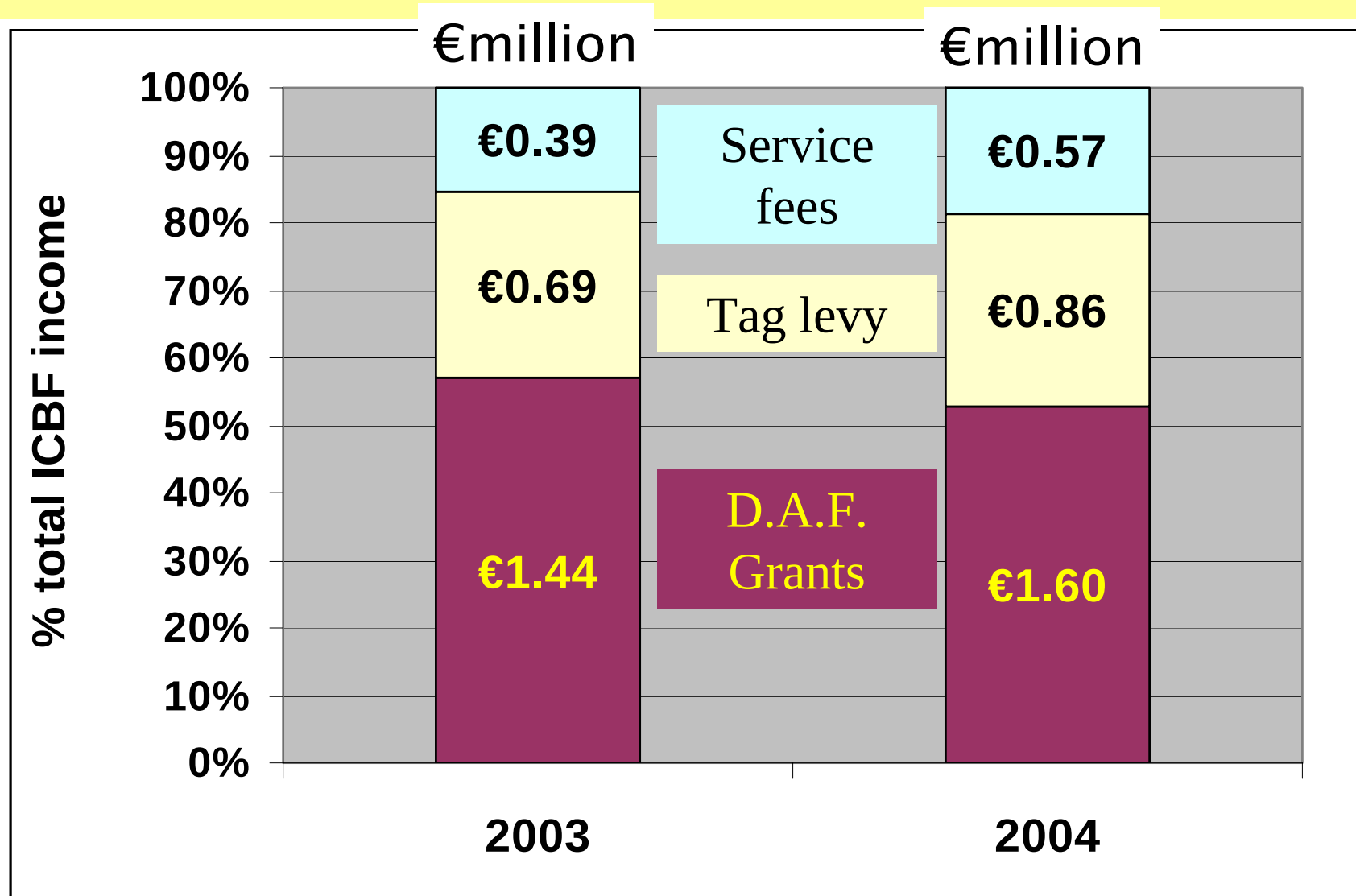
Three elements to achieve this are:

- **Ancestry and performance (€) data on most of the cattle in Ireland.**
- **Genetic evaluation to identify the best animals wherever they are in the world**
- **Optimal breeding scheme design for each breed.**

Ownership & Governance of ICBF



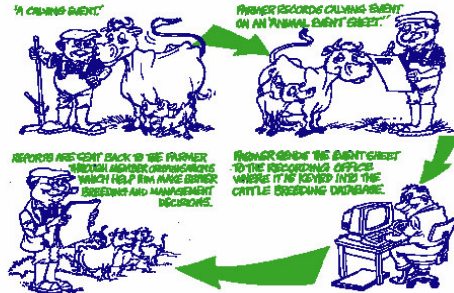
Funding of ICBF



Improved on-farm data collection

Animal events recording scheme

Prototype Booklet for Recording Animal Events



Prototype Event Recording Office
Slingsh House
Bandon
Co. Cork

This book has been developed by ICBS for its herdbook, milk recording and AI member organisations. Its purpose is to assist these organisations in the collection of data that will be used in their services to Irish cattle farmers.
© Irish Cattle Breeding Federation Society Limited 1999.

Data for DAF calf registration & passport, Pedigree/HB registration

Other events:
Insemination, Weights, Dry off, Treatments, Culling reason

Calving Details

is the reference number of this Animal Events Sheet

Note: Please return completed forms every 7 days

Section 1a - Details for National Bovine Animal Birth Registration Service*

Year of Event: 2001

AE Line No. 01 to 10

Calving Details

Dam of Calf Details: First 7 digits of calf tag, Last 5 digits of Calf Tag, Sex of Calf

Sire of Calf Details: AI Code/Ear Tag/Herdbook/Within-Herd Number, Breed of Sire

Calving Details: Date of Calving, Survey, Pedigree Name of Calf, Herdbook Registration Only (Note: Prefix Not Required)

Note: Always circle the appropriate code. Example 1: Sex of Calf **M** indicates a Male Calf, **F** indicates a Female Calf. Example 2: **1** indicates a calf that was born dead.

Section 2 - New Within Herd ID

Section 3 - Insemination or Service

Section 4 - Others

DECLARATION FOR NATIONAL BOVINE ANIMAL BIRTH REGISTRATION

Signature of herd owner: _____ Date: _____

PLEASE ENSURE YOU HAVE FULLY COMPLETED SECTION 1a AND SIGNED & DATED THIS FORM BEFORE POSTING.

*Please record all calving events. Only those that result in the birth of a live calf will be used for National Bovine Animal Birth Registration. Those that result in the birth of a dead calf will be used by ICBS for cattle breeding purposes only. Please record dead calves by leaving the calf ID field (last 5 digits of the calf tag blank).

Improved on-farm data collection

Animal events recording
scheme

Calving Details

A simple system capable of
capturing data from beef and
dairy herds without duplication

Data for DAF calf
registration & passport,
Pedigree/HB registration

Other events:
Insemination, Weights, Dry
off, Treatments, Culling
reason

11 12 13 14 15 16 17 18 19 20

Note: Ear Tag Numbers are only required when a calf is born. Please ensure you record the Ear Tag Number (or Brand/Tag Number) on all calves.

2. Recording an event on an animal (e.g. Insemination, Weights, Dry off, Treatments, Culling reason)

DECLARATION FOR NATIONAL BOVINE ANIMAL BIRTH REGISTRATION

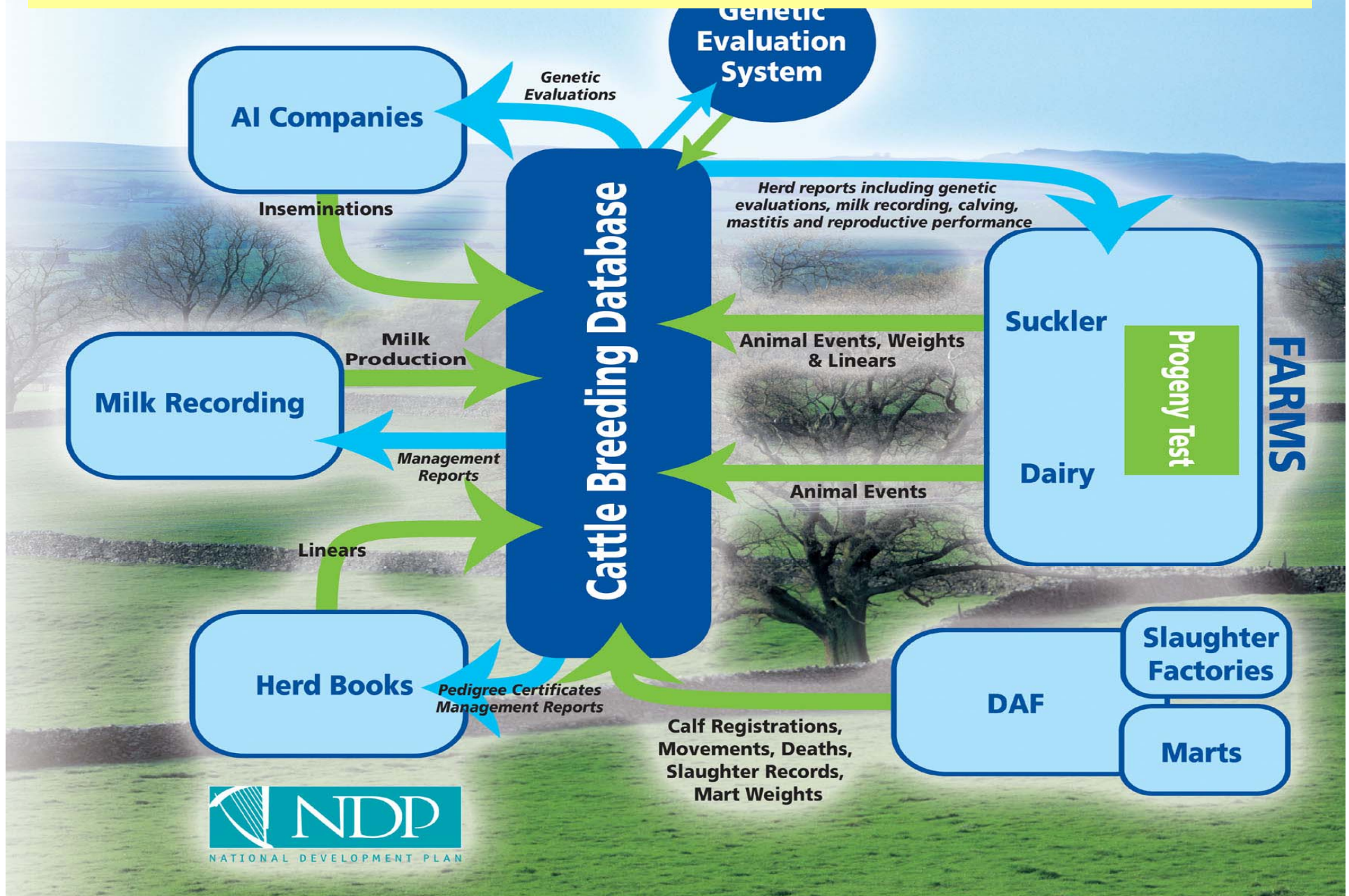
Declaration of owner/keeper of herd in which animal was born: I hereby declare that the details given by me in all sections of this Application form to be true and accurate. This application to be completed by owner/keeper of the herd in which animal was born, at the time of tagging, and posted immediately to the registration service.

Signature of herd owner: _____ Date: _____

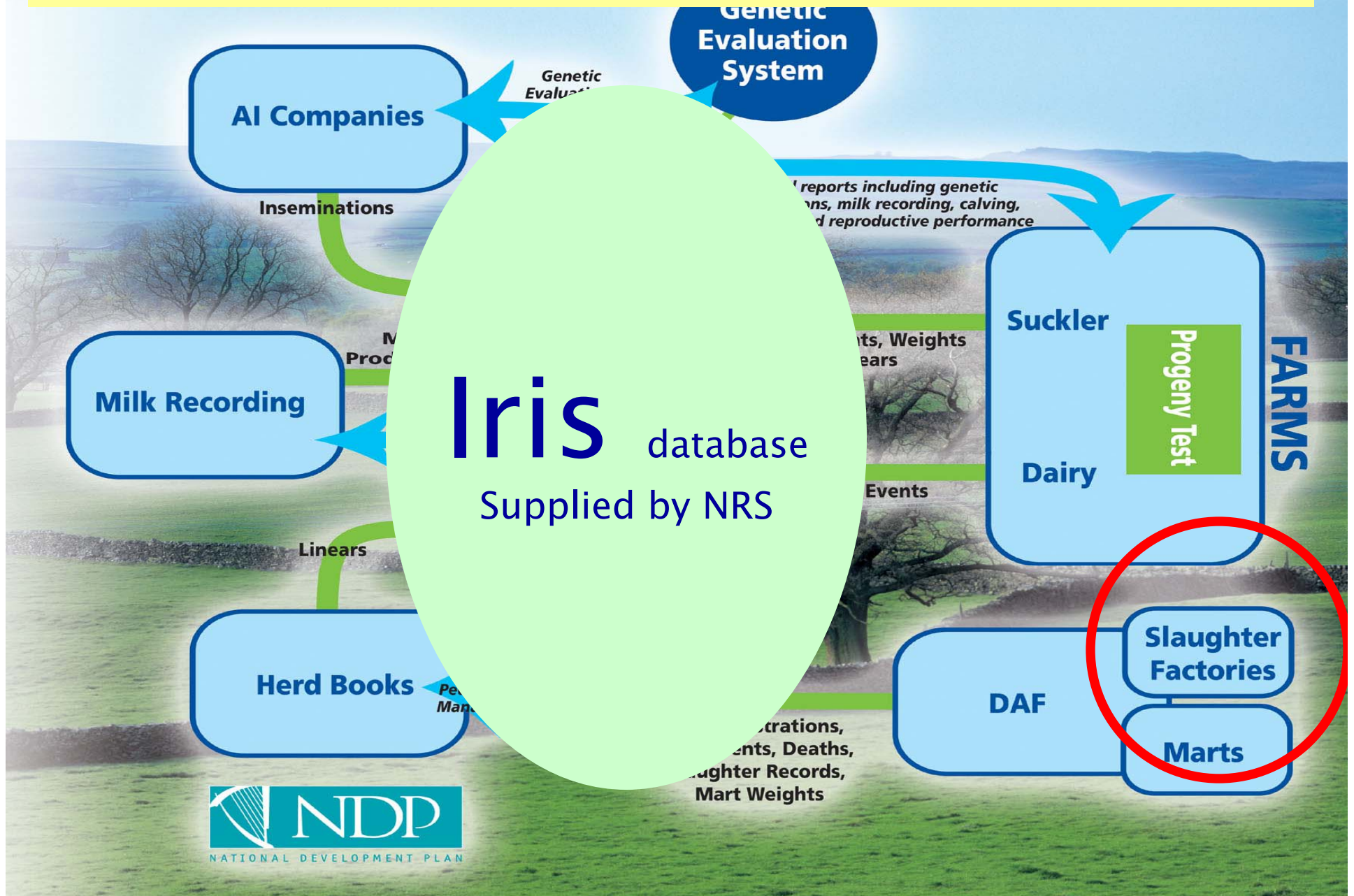
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Shared Access & One Copy of Truth



Shared Access & One Copy of Truth



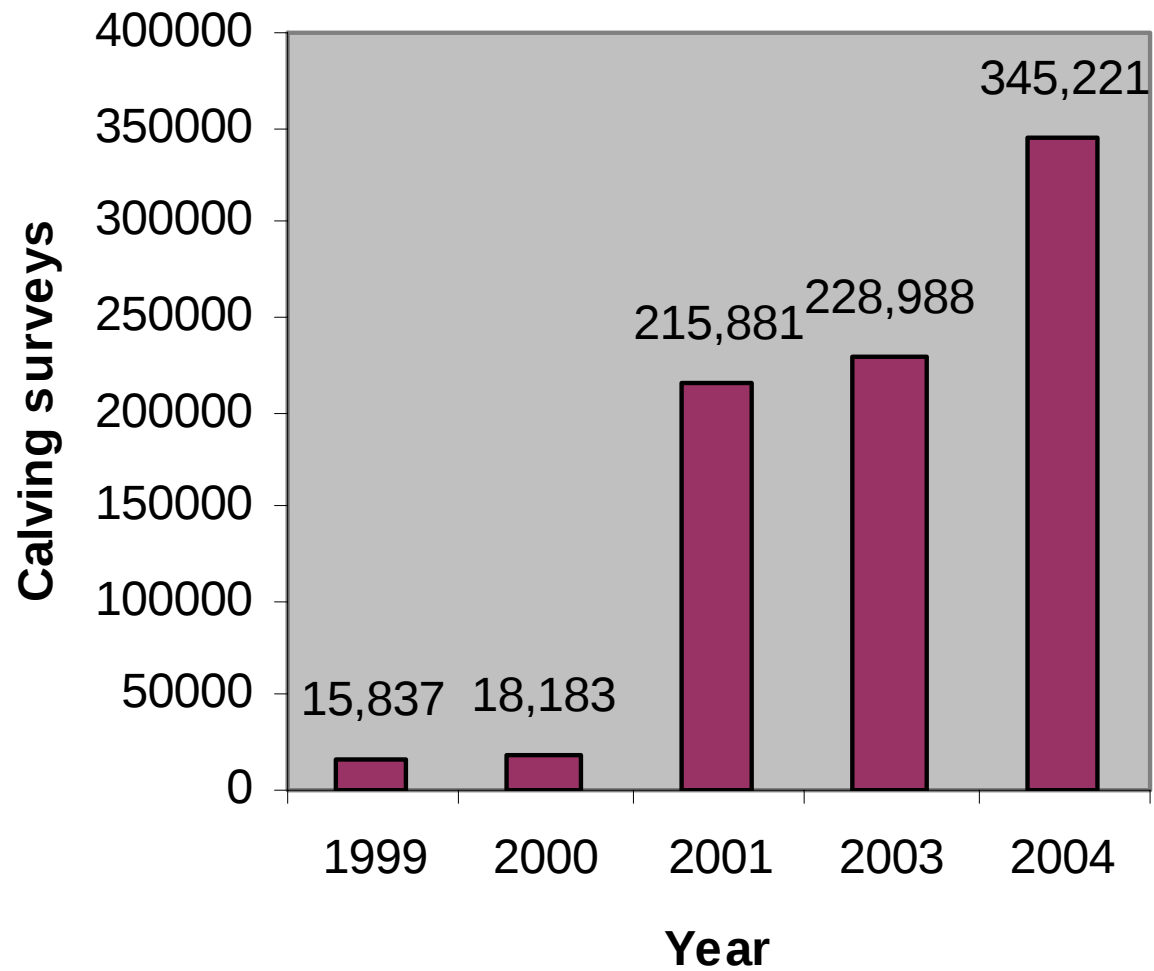
Electronic DIY Milk Recording

- Electronic meter and data handler.
- **Four** cells – van, 65 meters, 8 data handlers, printer, home computer, bar-coded sample vials, driver.





More & better data



Better Data - Breed combinations

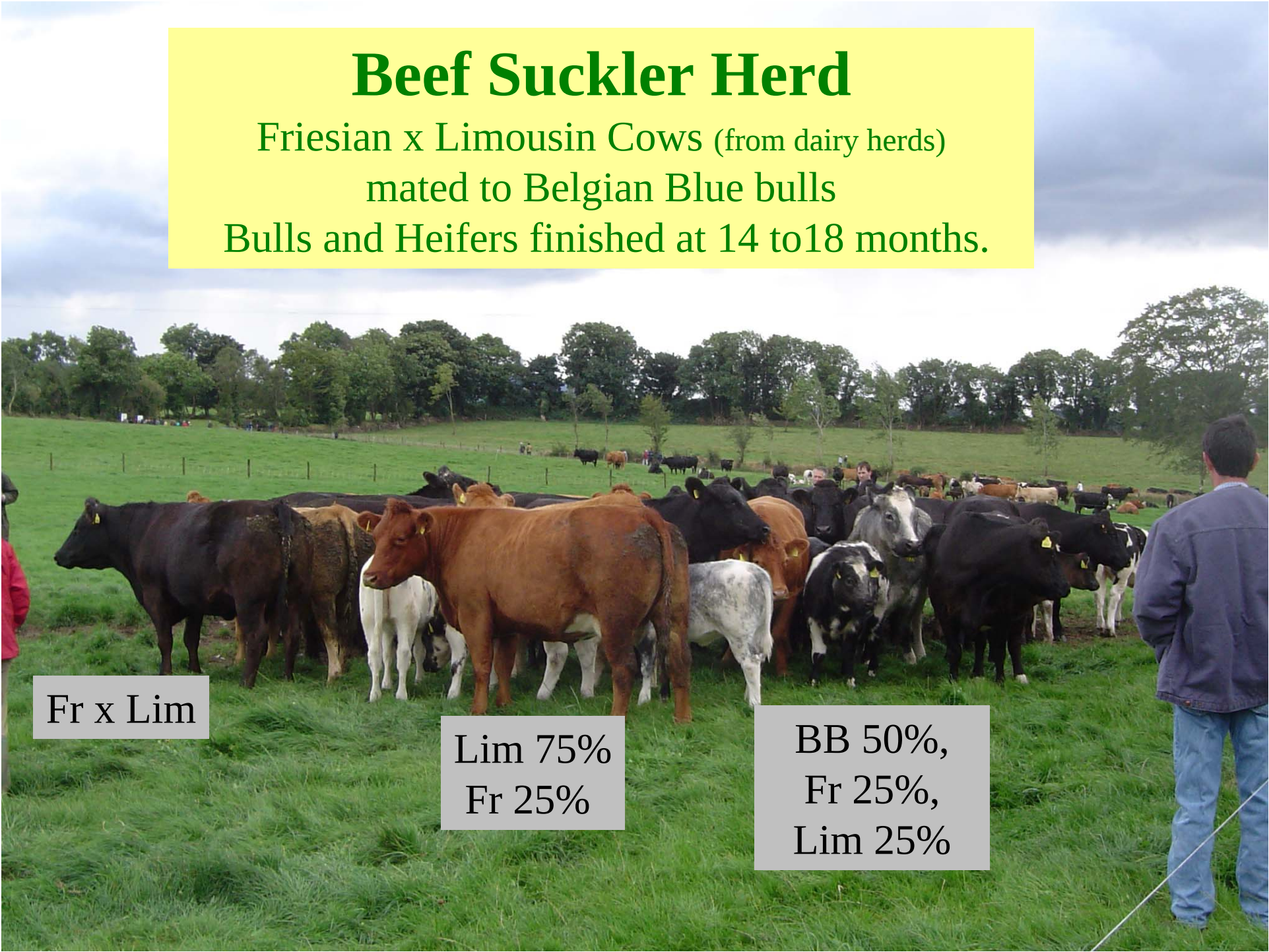
2004 calves		DAM BREED													
		AA	BA	BB	CH	HE	HF	JE	LM	MO	SA	SH	SI	RW	TOTAL
SIRE BREED	AA	3,207	19	219	236	203	26,788	58	338	470	25	210	253	137	32,163
	BA	39	573	68	56	51	496	0	117	13	0	18	84	4	1,519
	BB	299	55	631	412	295	10,571	25	774	271	43	81	498	57	14,012
	CH	1,331	42	672	16,005	1,266	3,788	36	2,623	134	143	517	2,218	27	28,802
	HE	193	8	89	195	3,682	15,506	44	217	231	8	90	194	60	20,517
	HF	261	17	197	219	193	167,343	287	243	852	42	136	311	203	170,304
	JE	8	1	1	2	3	1,398	589	3	14	0	0	12	8	2,039
	LM	825	75	803	1,931	922	10,280	25	12,818	301	48	363	1,614	90	30,095
	MO	15	1	9	10	15	3,065	8	25	2,289	3	10	45	38	5,533
	SA	89	3	36	92	51	196	0	94	9	640	32	101	1	1,344
	SH	48	2	15	31	44	662	1	46	10	9	1,241	38	25	2,172
	SI	245	5	102	404	295	4,555	6	383	97	29	74	4,161	25	10,381
	RW	1	0	0	2	2	319	1	4	7	0	3	9	146	494
	TOTAL	6,561	801	2,842	19,595	7,022	244,967	1,080	17,685	4,698	990	2,775	9,538	821	319,375

E.g. calves with Hereford sire or Hereford dam

2004 calves		DAM BREED													
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SIRE BREED	AA	3,207	19	219	236	203	26,788	58	338	470	25	210	253	137	32,163
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	SI	245	5	102	404	295	4,555	6	383	97	29	74	4,161	25	10,381
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	TOTAL	6,561	801	2,842	19,595	7,022	244,967	1,080	17,685	4,698	990	2,775	9,538	821	319,375

Beef Suckler Herd

Friesian x Limousin Cows (from dairy herds)
mated to Belgian Blue bulls
Bulls and Heifers finished at 14 to 18 months.



Fr x Lim

Lim 75%
Fr 25%

BB 50%,
Fr 25%,
Lim 25%

Genetic Evaluations

- **Objective** – Profit – EBI (economic breeding index)
- **Dairy** – EBI since 2001 & still evolving
- **Beef** – Under development
- **Expertise** – team from Holland, NZ, Ireland, France and Norway

Genetic Evaluations - combined indexes across breeds

Sire Details					Economic Sub Indexes								Calving Performance Data					Beef Performance Data									
Brd	Code	AI Station	Price	Avail	Name	Beef Production	Rel	Weaned Calf	Rel	Beef Calving	Rel	Dairy Calving	Rel	Recs	CD%	GL Days	Mort %	CD Mat	Recs	W wt	C wt	C Conf	C Fat	Cull Cow	L Wt	Calf Quality	Feed Intake
AA	BEH	NCBC	8	H	BOHEY LEO	€37.4	65	€49.6	68	-€4.5	71	-€8.5	80	156	-0.9	1.0	1.6	-0.9	33	-4.2	14.5	1.7	1.0	1.6	26.9	42.3	-34
AA	BJP	NCBC	8	H	BOHEY JASPER	€33.1	77	€55.4	81	-€3.5	79	-€9.8	88	400	-0.7	1.2	1.2	-1.1	83	-1.7	13.5	1.8	1.2	-4.1	32.2	44.3	3
AA	DVE	NCBC	10	H	DRUMDEEVIN DANCER	€55.2	81	€59.4	85	-€4.2	73	-€19.2	84	326	0.7	2.1	0.5	-1.5	105	-6.0	20.6	2.1	0.9	7.1	26.7	51.7	-76
AA	EOB	NCBC	8	H	EDMUNDO OF BALLINULTY	€25.3	90	€64.5	93	€1.7	96	€7.1	98	8707	-2.6	-0.1	0.8	-0.8	947	2.8	9.6	1.8	0.9	-4.2	37.8	46.7	26
AA	EOC	NCBC	8	H	EARL OF CREROGUE	€40.2	74	€70.7	74	€2.3	76	€5.4	88	412	-1.1	-0.2	-0.1	-1.2	70	-1.3	15.0	2.2	1.2	-6.4	30.0	55.7	-27

Economic Sub Indexes							
Beef Production	Rel	Weaned Calf	Rel	Beef Calving	Rel	Dairy Calving	Rel
€37.4	65	€49.6	68	-€4.5	71	-€8.5	80
€33.1	77	€55.4	81	-€3.5	79	-€9.8	88
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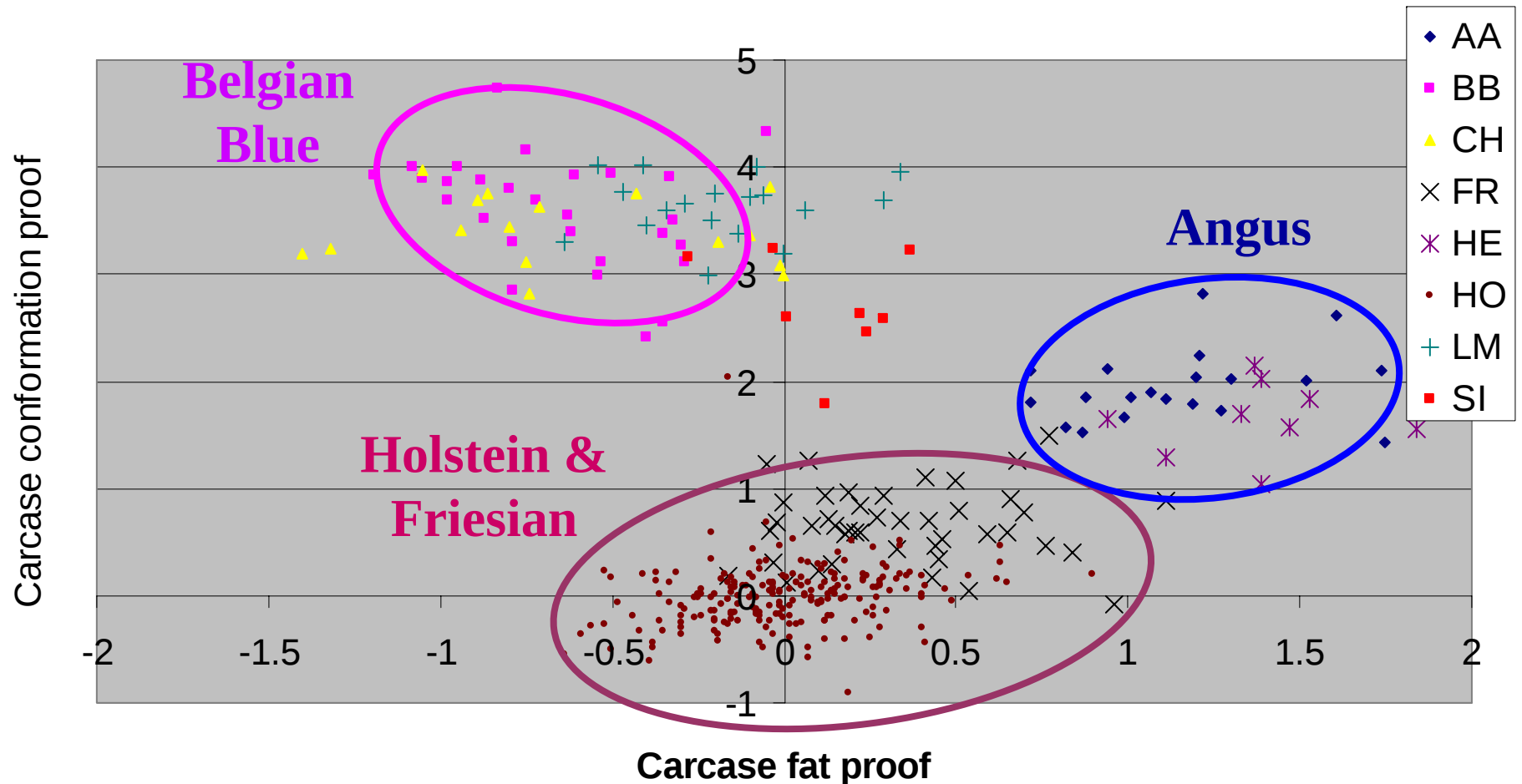
Calving Performance Data				
Re cs	CD%	GL Days	Mort %	CD Mat
156	-0.9	1.0	1.6	-0.9
400	-0.7	1.2	1.2	-1.1
326	0.7	2.1	0.5	-1.5
8707	-2.6	-0.1	0.8	-0.8
412	-1.1	-0.2	-0.1	-1.2

Genetic Evaluations - combined indexes across breeds

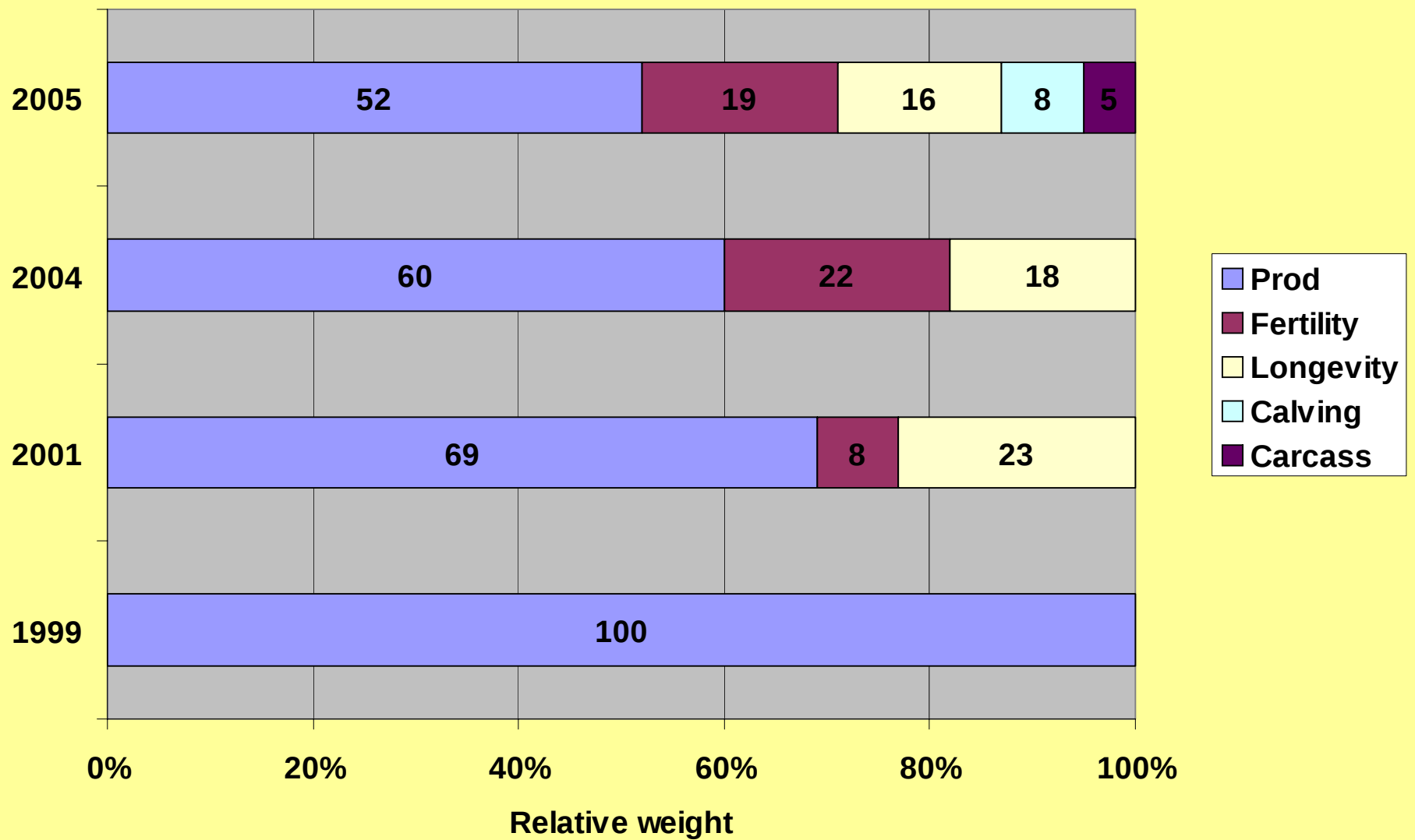
Sire Details					Economic Sub Indexes								Calving Performance Data					Beef Performance Data									
Brd	Code	AI Station	Price	Avail	Name	Beef Production	Rel	Weaned Calf	Rel	Beef Calving	Rel	Dairy Calving	Rel	Recs	CD%	GL Days	Mort %	CD Mat	Recs	W wt	C wt	C Conf	C Fat	Cull Cow	L Wt	Calf Quality	Feed Intake
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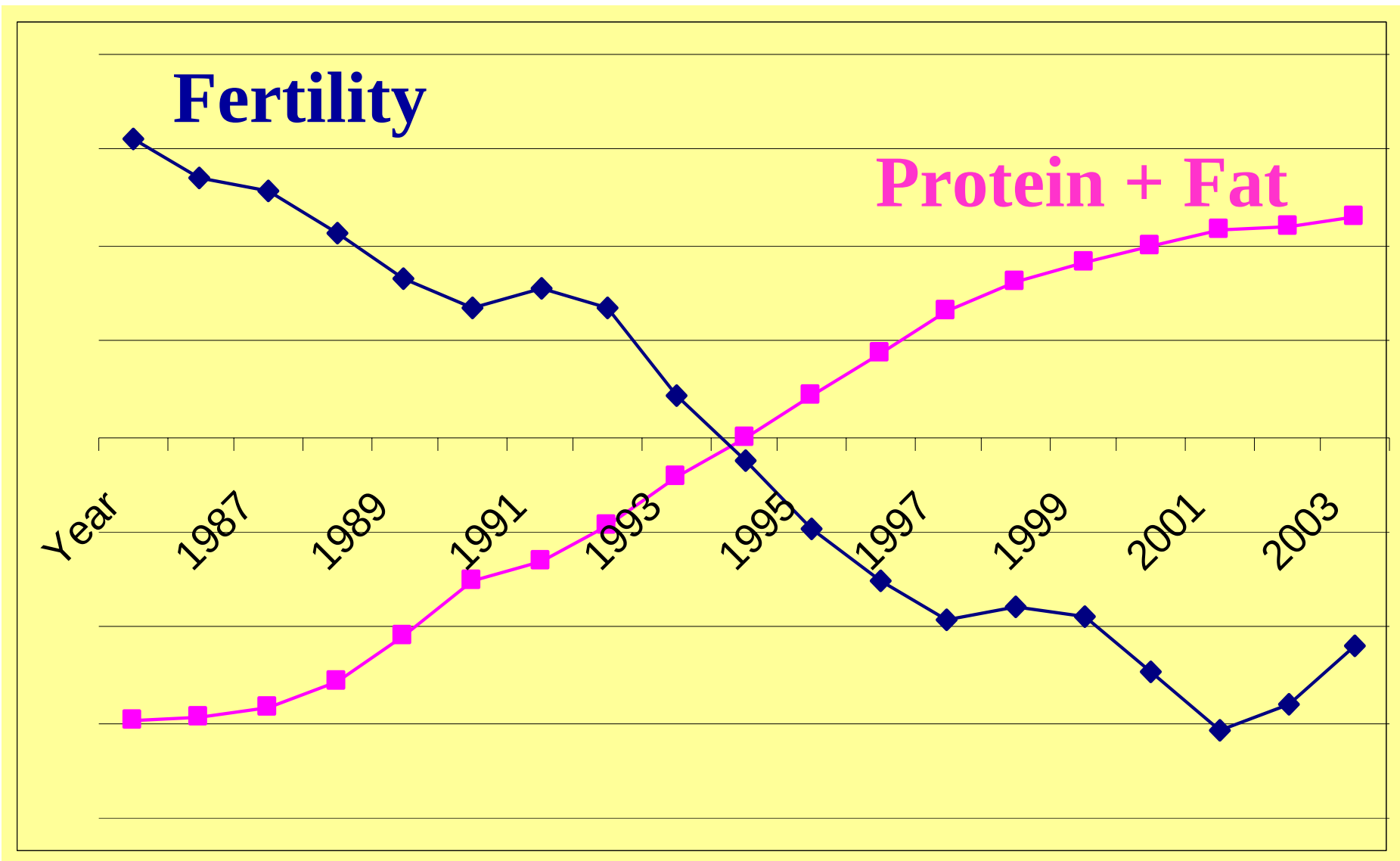
Across Breed Evaluations – Beef & Dairy for Carcase Traits



Evolution of the dairy EBI



Genetic Trends – Irish Holstein Friesian Females



Identification and selection of superior animals

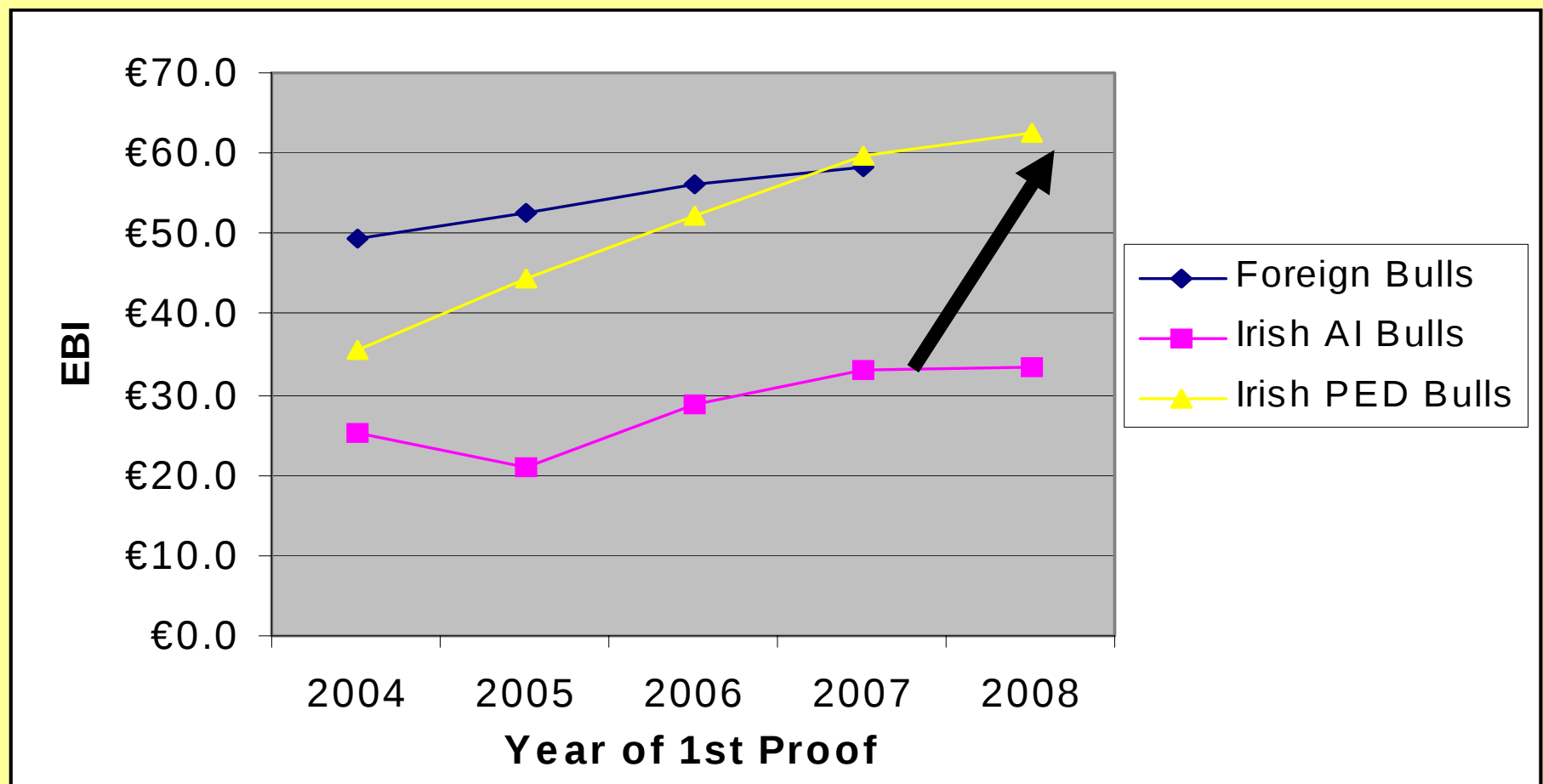
Where are the best animals for Ireland?

- Only 25% of test bulls are currently sourced locally
- Study to investigate best source
- Foreign compared with Irish AI & Pedigree young stock

	2004	2005	2006	2007	Totals
Org 1	76	56	52	29	213
Org 2	124	232	187	193	736
Org 3	188	189	149	76	602
Org 4	343	330	344	335	1,352
Org 5	333	300	282	167	1,082
Org 6		153	188	151	492
Org 7	392	299	341	171	1,203
Org 8	532	526	505	480	2,043
Totals	1,988	2,085	2,048	1,602	7,723

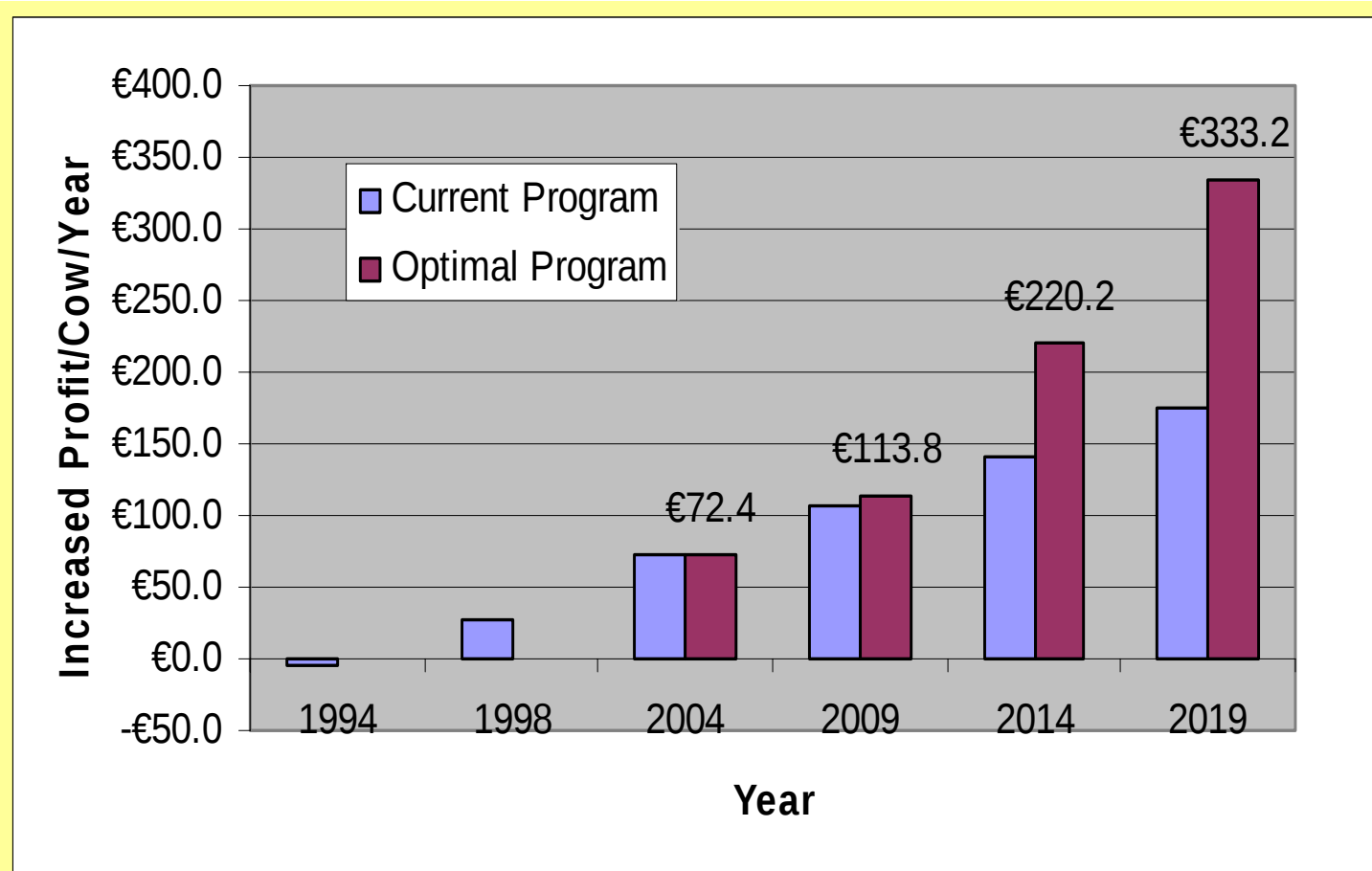
In terms of Irish objective:

- €20 between best of the foreign & current test bulls in Ireland.
- Irish herds contain young stock better than the best of foreign.
- Using the best bulls in Ireland now can deliver better proven bulls in 2008 than sourcing from best of all foreign programs.



Benefit of own testing program

- Current Gain= €6.8/cow/year
- Optimal Gain (100 bulls/100 dtrs.) = €23/cow/year
- Full benefits in 8 yrs, year on benefits thereafter.



GENE IRELAND – Progeny Test

- New progeny test program – **GENE IRELAND**
- Joint initiative involving ICBF & AI members
- **Dairy program** launched Spring 2005 - focused on EBI (100 bulls/year * 100 daughters).
- **Beef program** launched Autumn 2005 - focused on maternal sub-index (10-15 bulls tested per year * 100 daughters, with terminal sires also tested).

GENE IRELAND – Elements

- ***Candidate lists*** – potential young bulls
- ***Contracted herds*** – suitable herds identified, contacted & contracted (minimum 10 test heifers)
- ***Minimum criteria*** – target EBI for dairy 2006 = €100
- ***Allocation of semen*** – completely random, no choice of bull, minimum 10 bulls * 5 straws
- ***Inbreeding*** – mating advice to manage inbreeding
- ***Semen distribution*** – dispatched on behalf of all AI participants (national programme)
- ***Data collection*** – not just focused on milk recording or beef recording – ***fully integrated.***

Breeding Scheme Design – Beef & other dairy breeds

- Four pathways - what is optimal design for Irish producers?
- Research model

Work in progress!

Future

Microprocessor	Year of Introduction	Transistors
4004	1971	2,300
8008	1972	2,500
8080	1974	4,500
8086	1978	29,000
Intel286	1982	134,000
Intel386™ processor	1985	275,000
Intel486™ processor	1989	1,200,000
Intel® Pentium® processor	1993	3,100,000
Intel® Pentium® II processor	1997	7,500,000
Intel® Pentium® III processor	1999	9,500,000
Intel® Pentium® 4 processor	2000	42,000,000
Intel® Itanium® processor	2001	25,000,000
Intel® Itanium® 2 processor	2003	220,000,000
Intel® Itanium® 2 processor (9MB cache)	2004	592,000,000

Technologies for data collection

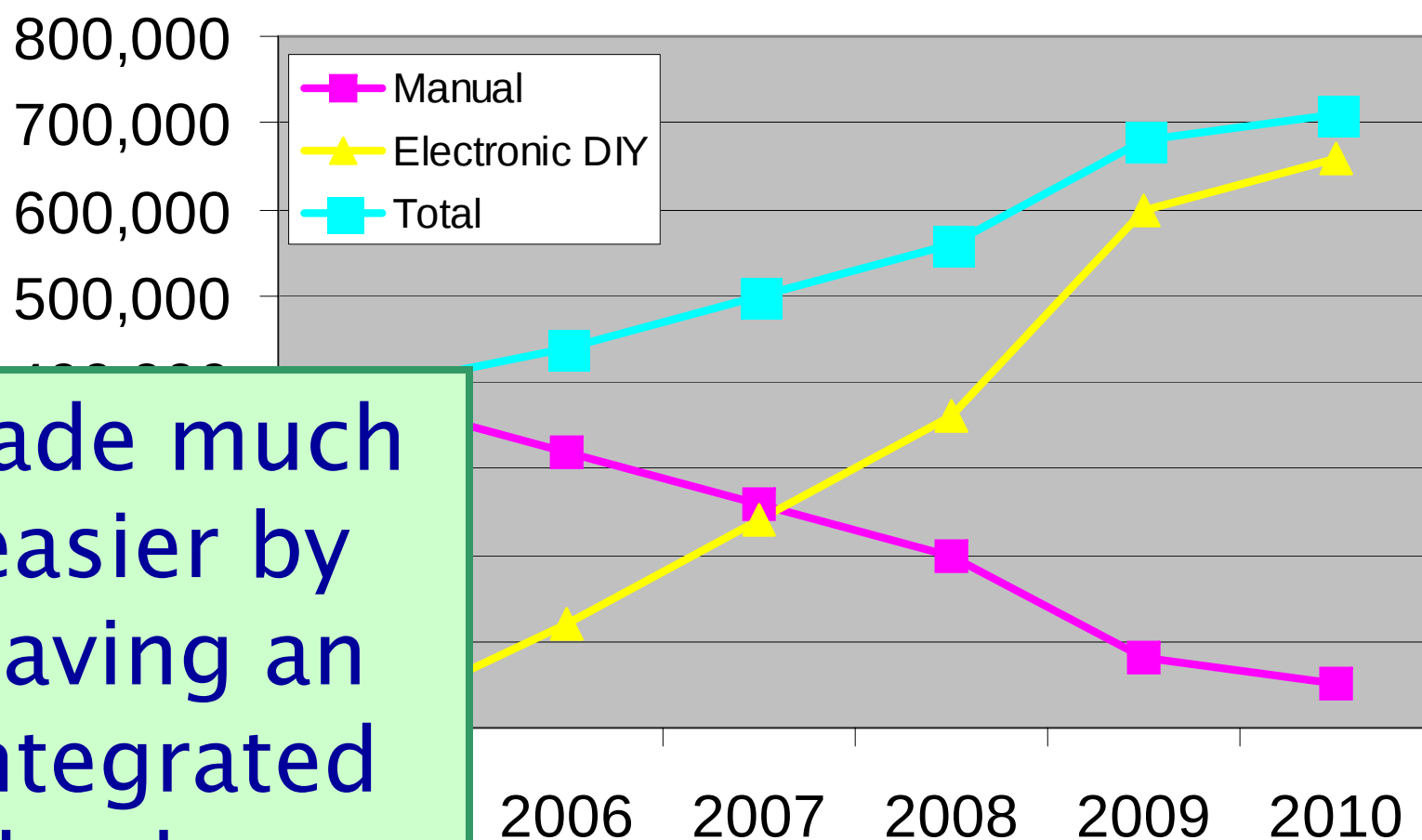
- Hand held computers
 - AI technicians (GPRS ...)
 - Linear scoring (across breeds)
 - Milk recording (+electronic meters)
- 2 way text messaging
 - Farmer alerts e.g. SCC level
 - Farmer requests
 - General reg. info for individual cows
 - Genetic evaluation results
 - AI & Service information
- Carcass grading machines
 - VBG systems for scoring marbling



All made
much easier
by having an
integrated
database

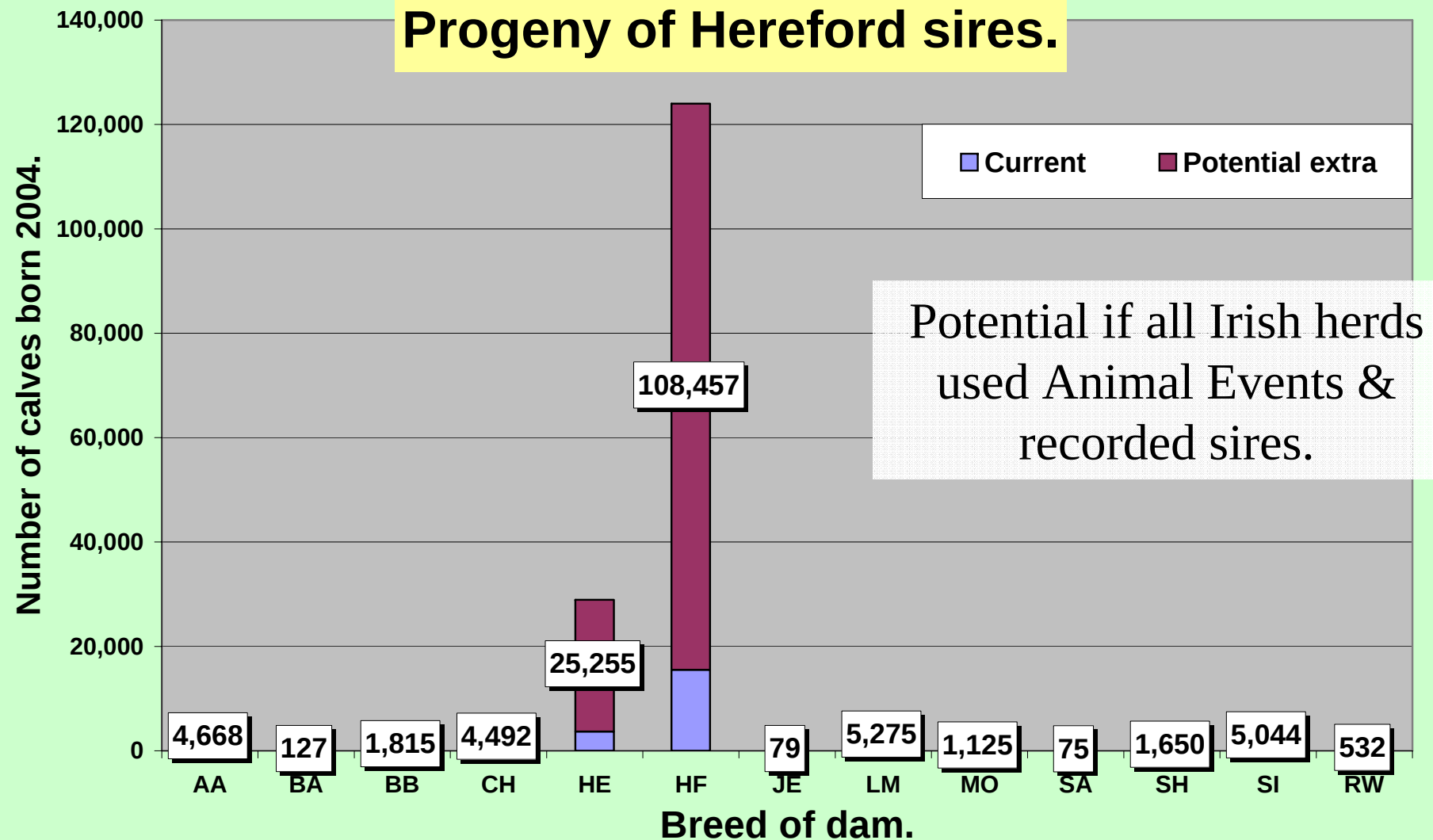


Projected Impact of Electronic DIY Milk Recording

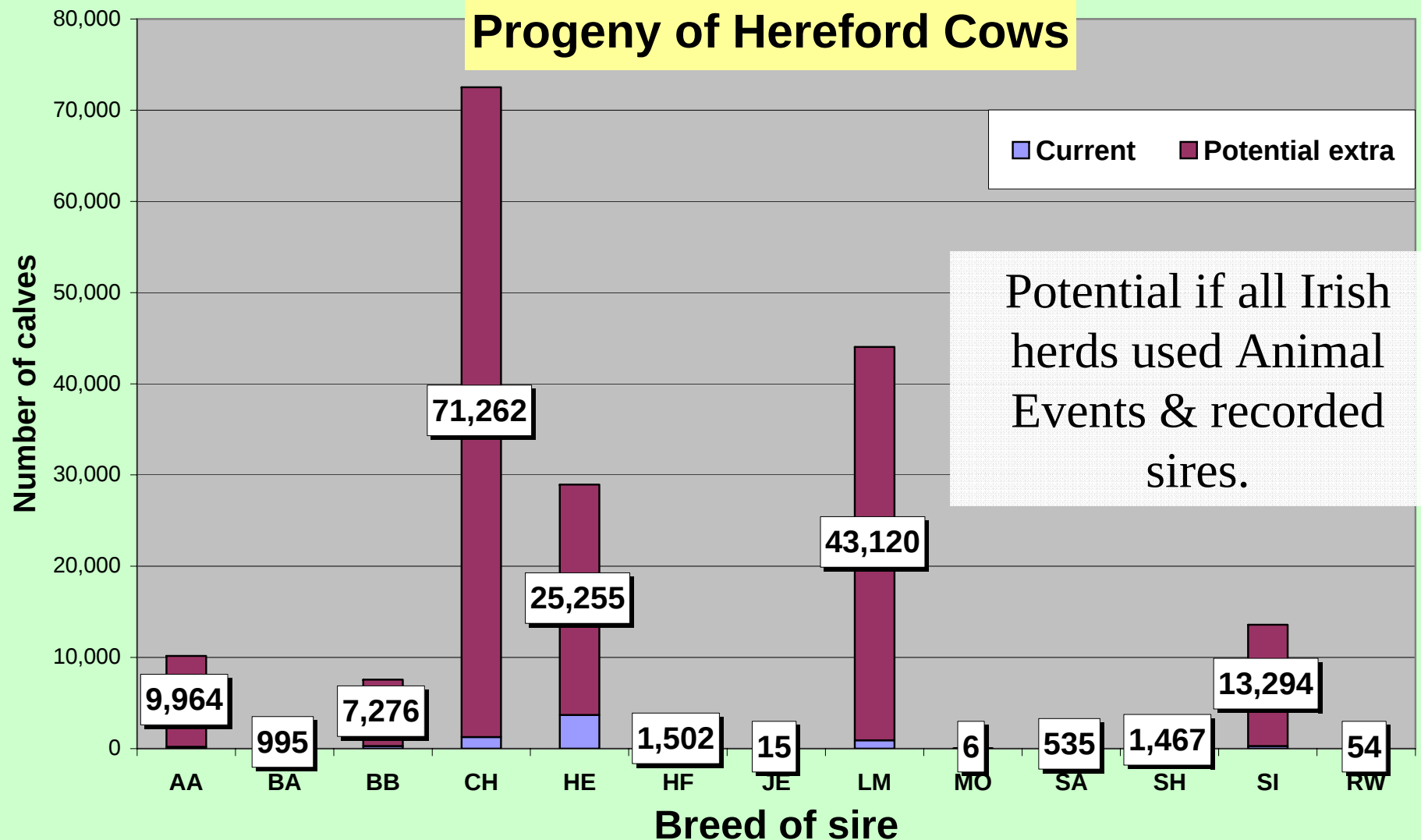


Made much easier by having an integrated database

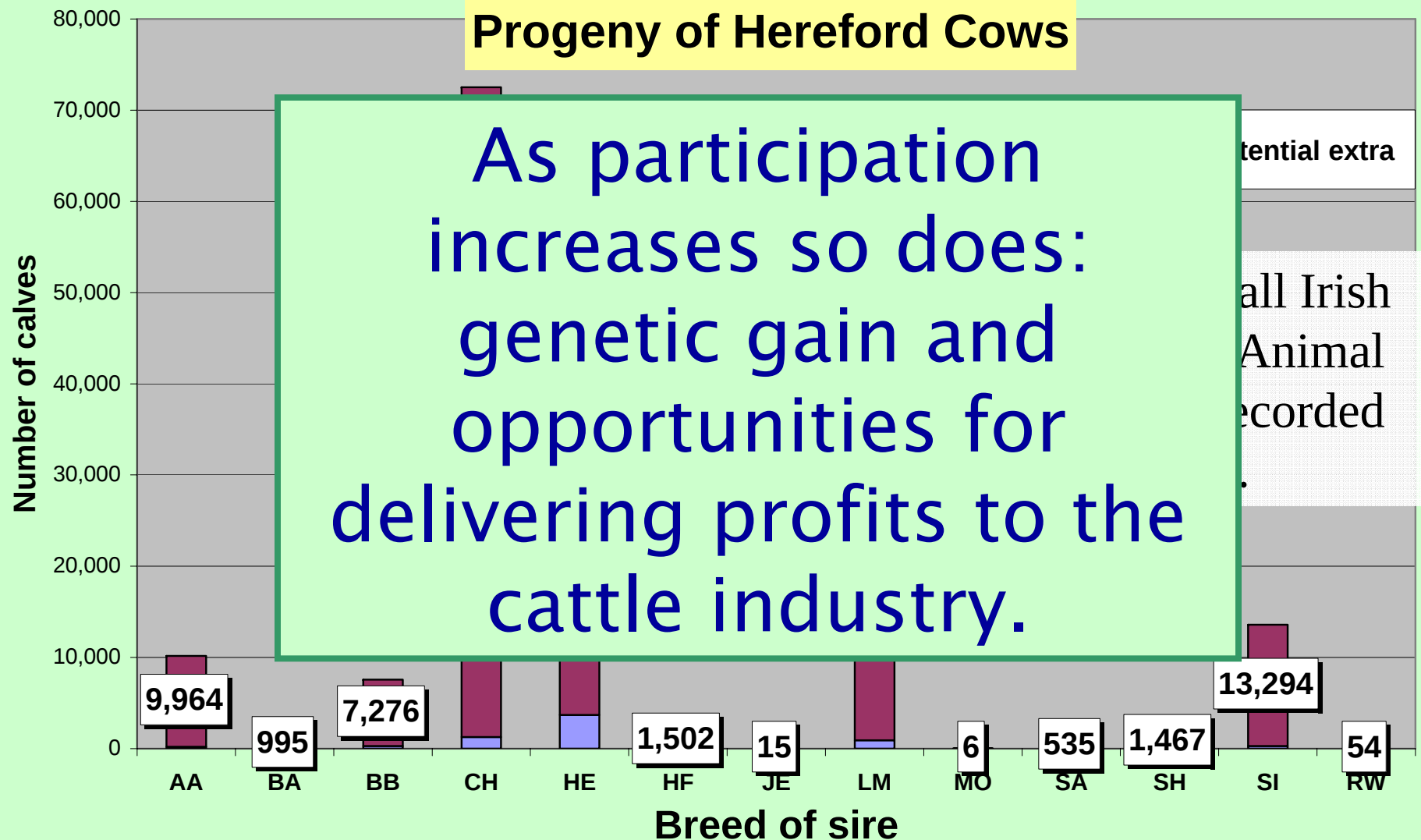
Much more performance recording e.g. Hereford sired calves



Much more performance recording e.g Herefords cows

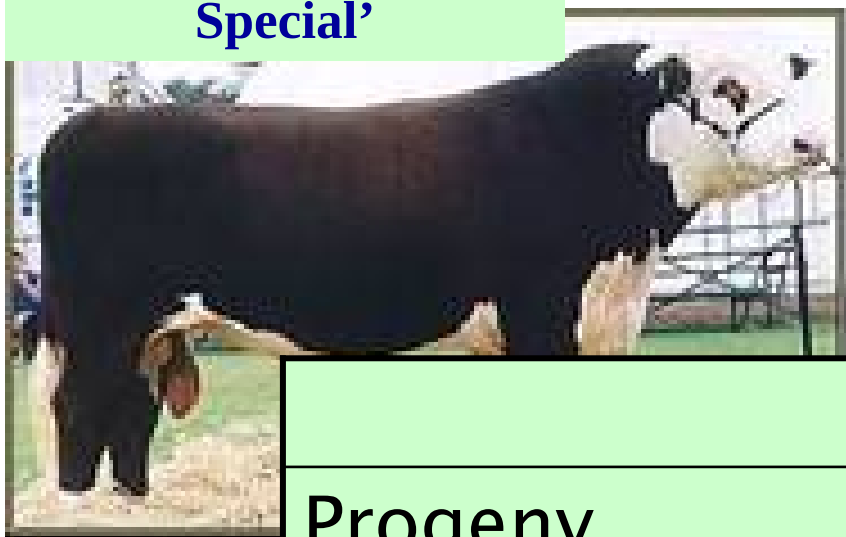


Much more performance recording e.g Herefords cows



International Beef Evaluations

**‘Smithston Something
Special’**



	Australia	Ireland
Progeny	287	244
Herds	14	102
Calving surveys	123	160
Weight records	281	53
Slaughter records	-	23

International Beef Evaluations

- Desirable – big & small populations
- Practical – connected populations, use phenotypes, fit complete models
- Organisation now needed – Steering Committee, ICAR Board & genetic evaluation units.

International Beef Evaluations

- Desirable
 - Practical
 - Organist
- Made much easier
for all breeds by
having an
integrated
database and
genetic evaluation
system
- ns
, use
ring

Molecular Biology

- Use
- Acc
- Bre to
use

The knowledge required to exploit these technologies in cattle breeding depends on access to an integrated database and genetic evaluation system.

Economics

- Reducing returns for cattle products
- Reduced funding for genetic evaluation activities
- Reduced supply of suitably skilled scientists
- **Recording organisations must be innovative**
- **More collaboration – nationally & internationally**

Summary - Future

- More data – reduced cost of collection
- Better data – more accurate & relevant
- Better genetic evaluations – data, international data, improved understanding of objectives
- Improved breeding scheme design – collaboration and research

Thus providing increased
profitability for beef and dairy
farmers.

