



IRISH CATTLE BREEDING FEDERATION

The Future Of Beef Breeding Euro-Stars and Genomics

Francis Kearney

ICBF

IGA Beef Conference

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Background

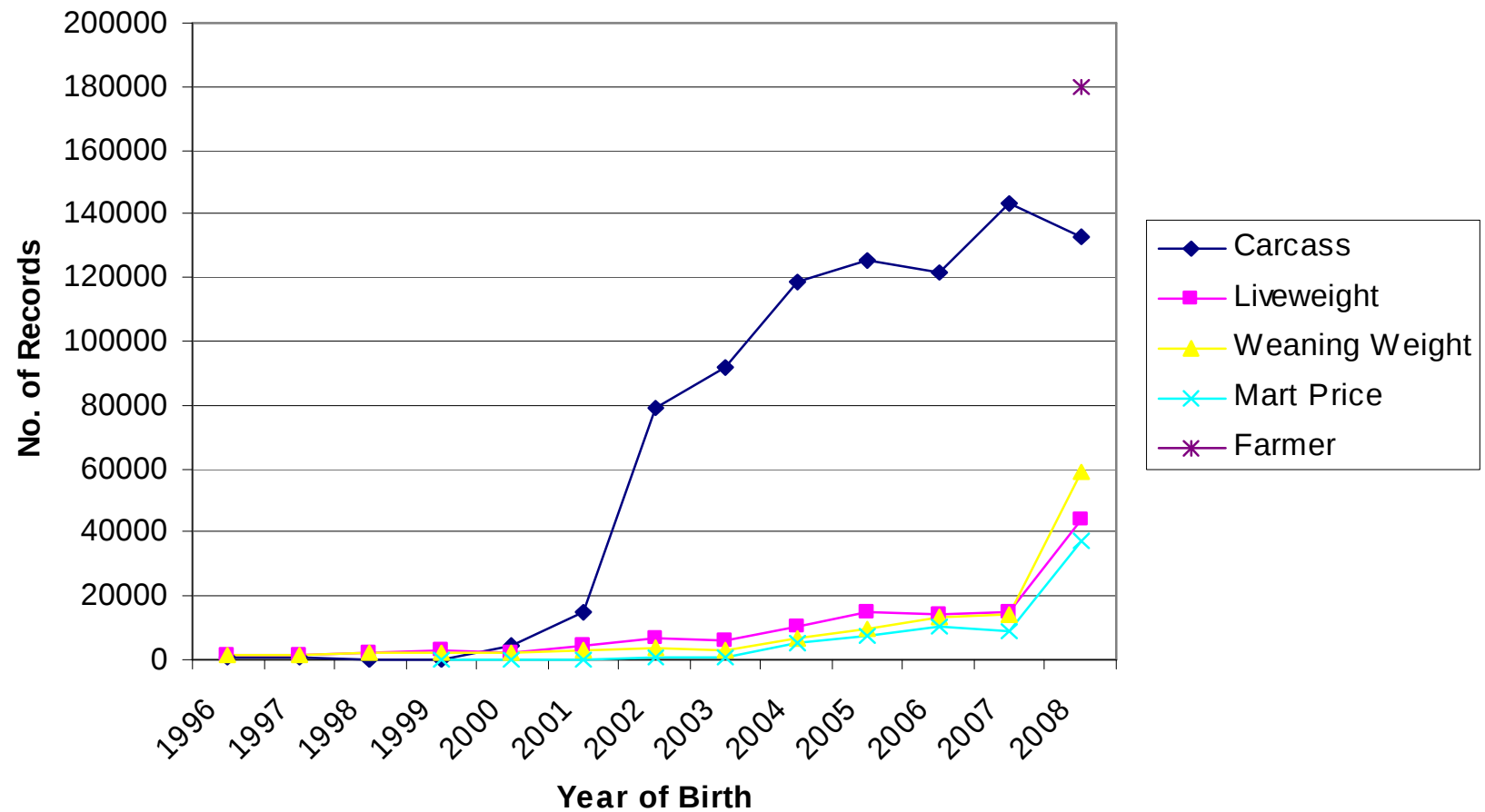
- Good indexes rely on large quantities of good quality information on which to assess animals
- ICBF database is now capturing data on all aspects of performance - unique throughout the world
- SCWS through sire recording has taken data recording to a new level
- Index reliability is increasing
- Enormous potential for R&D into the future
- Farmers/Breeders are ultimately the beneficiaries

Database

Breed	Total No of Sires	Calving Ease	Gestation	Mortality	Weaning Weight	Live Weight	Calf Quality	Feed Intake	Carcass	Age First Calving	Maternal Wean Weight	Calving Interval	Cull Cow Weight
Angus	12,150	378,538	73,021	401,149	5,371	10,030	2,764	143	125,570	21,420	2,887	13,047	9,734
Aubrac	679	10,079	469	10,473	895	436	139	45	1,841	1,225	316	741	186
Belgian Blue	2,658	143,283	37,892	159,067	11,652	8,462	8,068	80	43,323	10,791	2,194	6,622	5,064
Blonde Aq	931	23,462	1,234	24,429	1,723	916	819	94	3,768	2,054	442	1,124	405
Charolais	26,787	643,930	20,135	664,109	67,686	45,860	39,229	848	102,390	26,569	17,404	16,210	11,185
Hereford	7,083	189,425	29,004	195,125	2,976	5,941	681	161	61,773	12,560	1,928	7,549	5,193
Limousine	21,201	614,281	37,269	640,733	48,695	37,693	27,459	1,257	101,478	42,468	18,513	26,319	11,496
Parthenaise	337	4,971	288	5,408	349	281	128	21	545	407	64	153	84
Piemontese	270	3,885	287	4,011	303	166	71	12	541	442	82	225	50
Romagnola	31	345	11	304	26	26	6	1	69	36	0	23	11
Saler	1,252	25,208	1,828	26,003	1,316	1,175	650	77	3,755	2,766	512	1,632	348
Shorthorn	1,760	24,487	1,908	25,137	951	567	582	18	2,773	4,936	834	3,146	750
Simmental	6,029	136,775	10,380	139,657	12,298	10,566	4,147	934	30,900	17,558	7,509	10,755	3,623

Large no. of records for calving, weaning and carcass
 Small no. of records on maternal traits
 Small no. of records for some breeds

Data Recording



€uro-Stars

- €uro-Star indexes utilise all available information to determine the most profitable animals to breed from
- Objective assessment of genetic merit of animals
- Increase in indexes must be reflected on farm otherwise no value to selecting from them
- Validation is very important to ensure the value is being reflected

€uro-Stars

€uro-Star Rating (ICBF, Aug 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:	Aug 2010	MGS:	CAMPAGNARD / 1887109836
National ID:		Euro-star Index Calving Traits Weanling Beef Carcass Milk			
International ID:	CHLFRAM007197126709	Linear Type Pedigree Fertility Prev Eval			

% Rank	Star Rating (within breed)	Index and Traits	€uro-Value	Data Reliability	Star Rating (across breed)	% Rank
91%	★★★★★	Suckler Beef Value (SBV)	€129	99%	★★★★★	93%
99%	★★★★★	Weanling Export	€107	99%	★★★★★	99%
99%	★★★★★	Beef Carcass	€176	99%	★★★★★	99%
1%	★	Daughter Fertility	€89	93%	★	1%
1%	★	Daughter Milk	€126	96%	★	1%
Other Key Traits						
12%	★	Calving Difficulty (% 3 or 4)	11.30%	99%	★	5%
99%	★★★★★	Gestation Length (Days)	.87 Day(s)	99%	★★★★★	78%
93%	★★★★★	Docility (1-5 score)	0.15	99%	★★★★★	94%

Data Reliability: 40% - 60% = Average

20 - 40% = Below Average

< 20% = Poor

€uro-Stars - Weanlings

Sex	Data	1 star	2 star	3 star	4 star	5 star
Male Weanlings	Age at sale (days)	226	226	222	225	226
	Weight at sale (kg)	294	309	319	333	354
	Price (€/animal)	€485.0	€534.8	€570.4	€604.8	€669.5
	Price (€/kg)	€1.65	€1.74	€1.79	€1.82	€1.89
	Average SBV	€20.1	€43.1	€58.5	€74.2	€99.4
Female Weanlings	Age at sale (days)	227	227	226	226	231
	Weight at sale (kg)	258	276	282	295	316
	Price (€/animal)	€377.6	€424.3	€446.8	€467.9	€543.4
	Price (€/kg)	€1.46	€1.61	€1.58	€1.59	€1.72
	Average SBV	€21.3	€43.1	€58.6	€74.0	€98.8

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€uro-Stars - Slaughter

Type	Data	1 STAR	2 STARS	3 STARS	4 STARS	5 STARS
STEER	Carcass weight (kg)	354.3	375.4	382.4	386.5	396.7
	Price/kg	€2.86	€2.88	€2.89	€2.90	€2.90
	Carcass value	€1,016	€1,085	€1,109	€1,123	€1,152
	Age at slaughter (mths)	23.1	23.1	23.1	23.2	23.3
	Suckler Beef Value	€19	€42	€58	€74	€99
YOUNG BULLS	Carcass weight (kg)	393.2	403.3	409.5	417.2	423.8
	Price/kg	€2.89	€2.90	€2.90	€2.91	€2.91
	Carcass value	€1,138	€1,171	€1,190	€1,215	€1,232
	Age at slaughter (mths)	21.7	21.8	21.8	21.7	21.6
	Suckler Beef Value	€21	€42	€58	€74	€100
HEIFERS	Carcass weight (kg)	293.3	305	310.1	316.8	324.7
	Price/kg	€2.89	€2.92	€2.92	€2.93	€2.94
	Carcass value	€850	€892	€909	€931	€956
	Age at slaughter (mths)	22.4	22.4	22.5	22.6	22.8
	Suckler Beef Value	€20	€42	€58	€74	€98

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€uro-Stars - Maternal

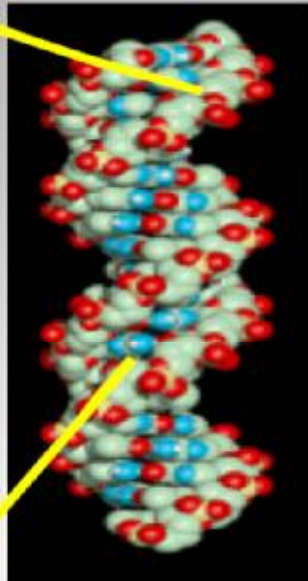
- Low amounts of data – more recording needed
- Grange trial should shed some light on the effectiveness of maternal indexes
- Evans et al., (2009) – clear link between maternal milk & fertility and life time profit
- Farmers need to plan replacement strategy carefully

Genomics

- Biggest advance in animal breeding since AI
- DNA can provide another source of information in addition to pedigree, performance and progeny
- By looking at the DNA profile of a young animal we can predict with more accuracy how good they will be
- Need to assess what constitutes a “good” DNA signature
- Do this by relating highly proven bulls to their DNA profile

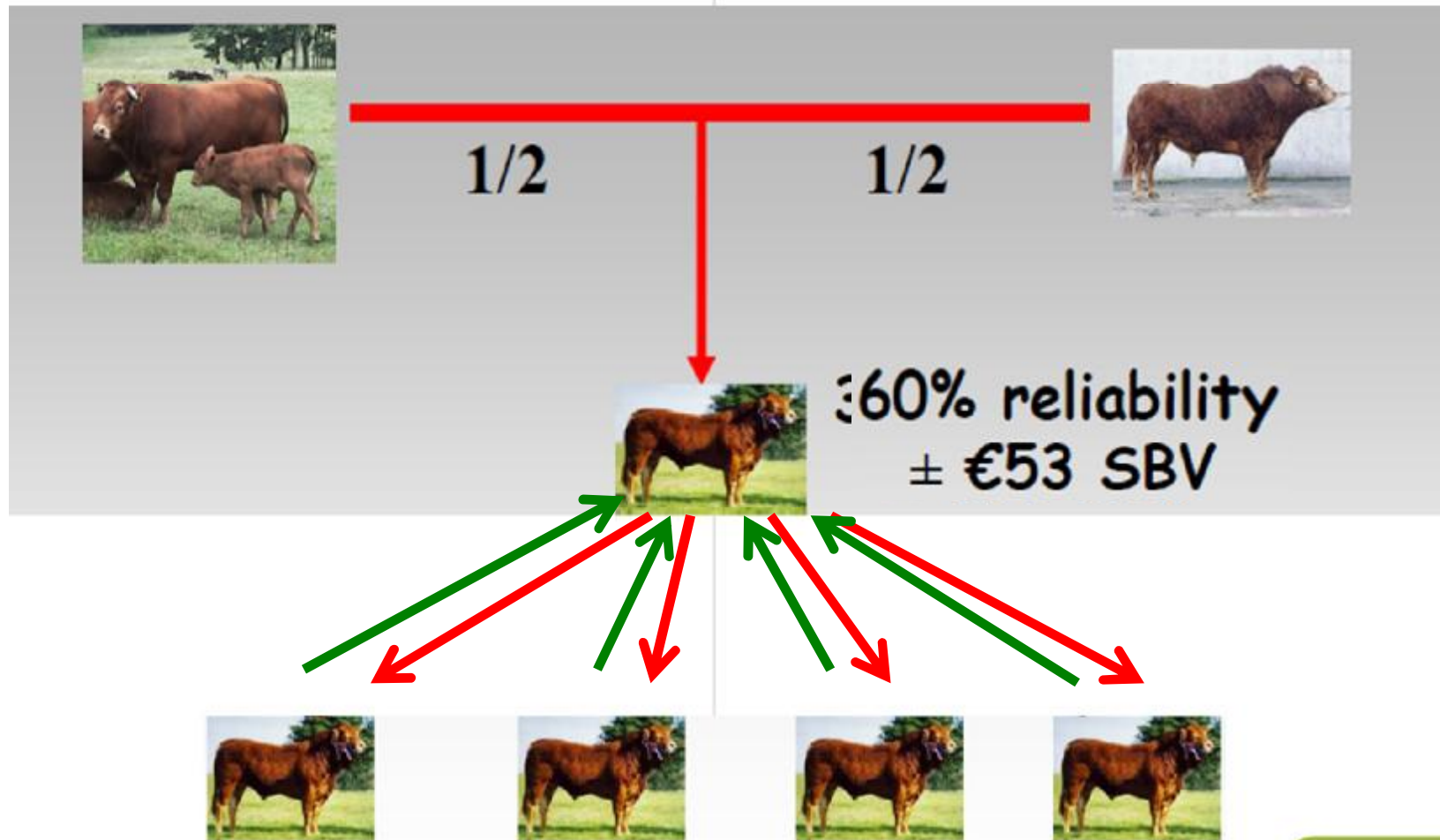
Genomics

Gene	Carcass	Calving	Docility
1	+3	-1	-0.3
2	+2.5	-2	-0.09
3	-0.3	+0.9	+0.3
4	+4	-0.2	-0.54
5	-7	+2	+0.14
⋮	⋮	⋮	⋮
800,000	-14	+3	+1.1

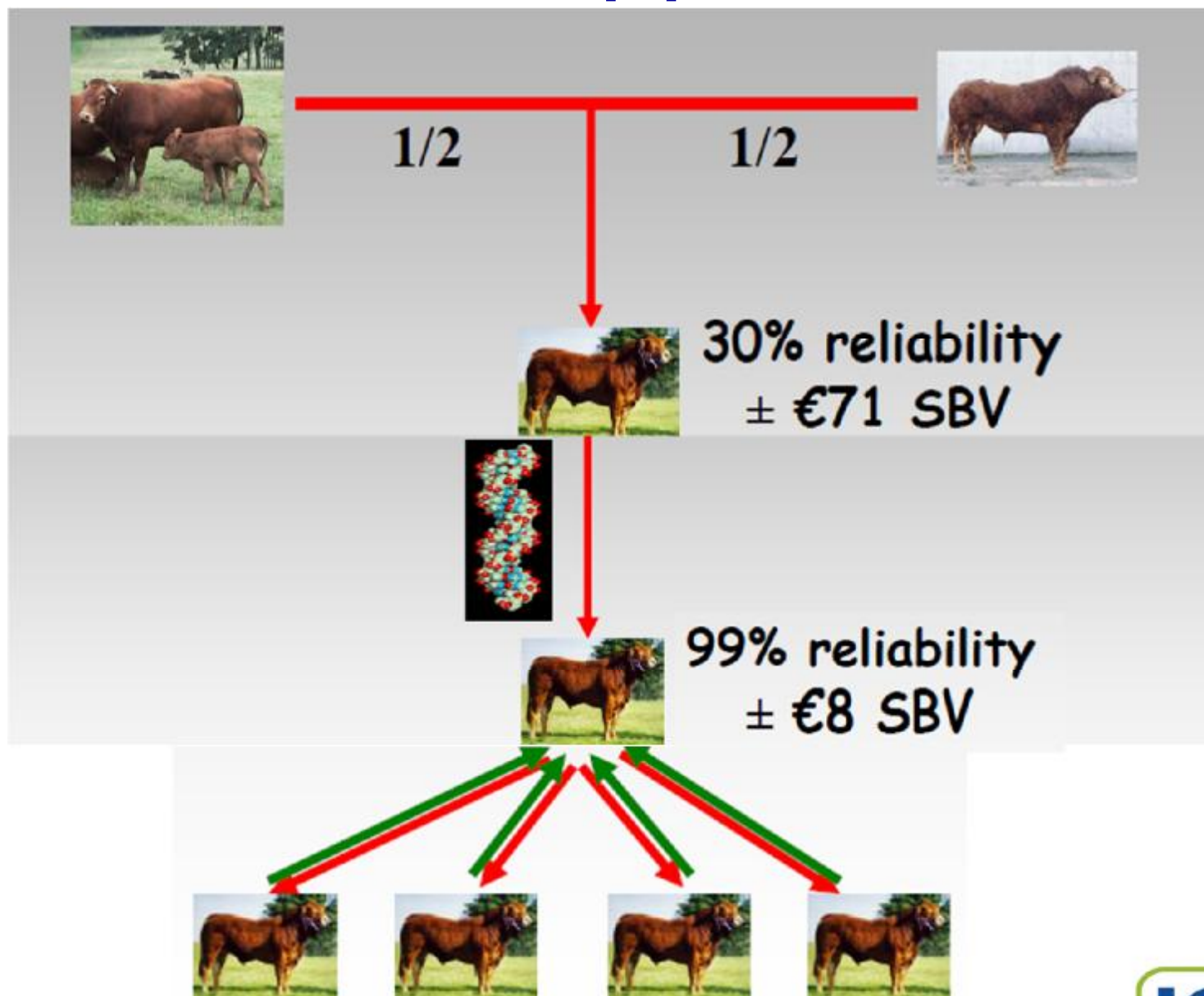


- Profile based on looking at the genes of many (~1000) well proven bulls for each trait

Current Approach



New Approach



Current Status

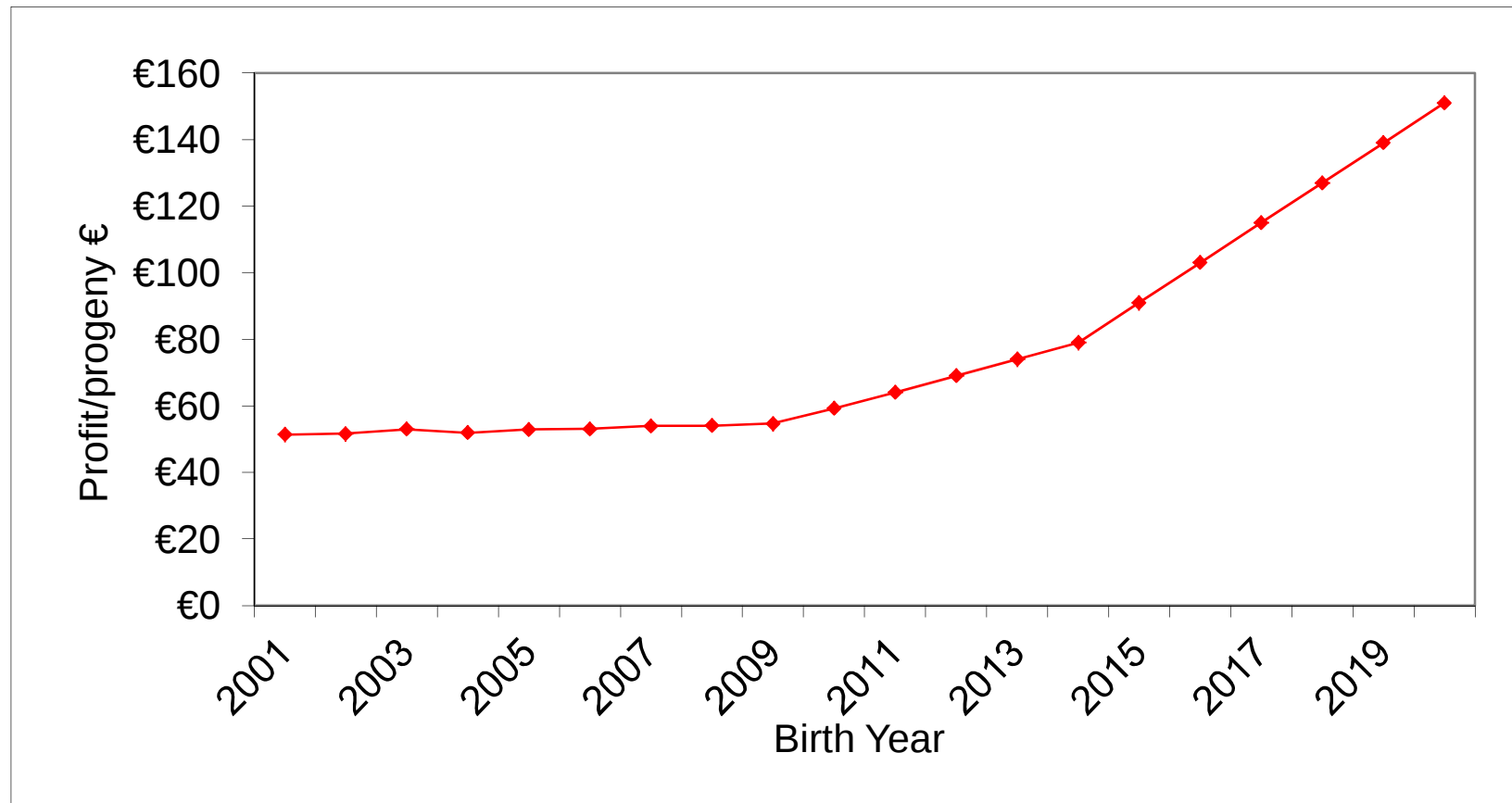
- Collecting tissue (semen, blood) from highly proven AI and stock bulls
- List of AI bulls wanted on ICBF website

BREED	AI bulls	Tully bulls	Stock bulls '09	Moorepark	Stock bulls '10	TOTAL	Missing AI bulls	Potential
AA	40	29	9	25	31	134	121	255
AU	2	2	3		1	8	28	36
BA	13	9			1	23	42	65
BB	48	9	1		5	63	118	181
CH	73	73	22	1	126	295	194	489
HE	39	21	10	8	22	100	139	239
LM	71	98	36	1	124	330	157	487
PI	2	3	1			6	23	29
PT	4	4				8	12	20
SA	10	12			2	24	27	51
SI	49	58	15	1	19	142	96	238
TOTAL	351	318	97	36	331	1133	957	2090

Implementation

- Once the DNA profile (genotype) has been received an analysis will be undertaken to determine what the best DNA signature is (2011)
- Can then estimate how good the DNA signature of the calf is compared to the “best” DNA signature
- More reliable indexes for stock bulls and young AI bulls (and females)
- Current cost of genotype is €300 but likely to fall

Potential - SBV



Summary

- Always use indexes as a guide when selecting AI bulls or buying stock bull to suit your system
- Replacement strategy is important – choose wisely!
- Data quantity and quality is increasing reliability
- Improvements continually been done in terms of traits to be evaluated, best statistical models and updating of cost assumptions

Summary

- Genomics offers a new source of information but doesn't change the principle of genetic indexes
- Will lead to further increases in reliability and genetic gain especially for young animals & maternal traits
- Use of genomic information will become the norm in the next few years
- Check your AI tanks for wanted bulls €€!!