Developments in Beef Cattle Breeding
New €uro-Star Indexes.

AI technician meeting

5/7th March 2013.

Stephen Conroy, ICBF

Noirin McHugh, Teagasc

Topics to be discussed

- Background to genetic evaluations
- How to interpret €uro-Star Indexes
- Do indexes work at farm level?

1. What are genetic evaluations?

- **Combination of performance data and ancestry**

- **Estimate heritability of each trait you can measure by:**
  - **Removing all non-genetic influences that can be measured such as herd, age, feeding levels, carcass type (steer, bull, heifer)**

    - **Highly heritable: liveweights, carcass, muscle**
    - **Moderately heritable: calving difficulty, milk**
    - **Lowly heritable: mortality, fertility**

  - **Estimate the genetic relationship between traits**
    - **Weaning weight and carcass weight: favourable**
    - **Muscularity and Calving difficulty: unfavourable**
    - **Muscularity and daughter fertility: unfavourable**

- **Use these genetic relationships in a genetic evaluation with all the performance data and ancestry**
  - **Produce breeding values**
  - **PTAs are published which are half the breeding value**

What drives profit on commercial beef herds in Ireland?

- **Calving difficulty (labour cost, Vet cost, infertility)**
- **Gestation (loss of end product)**
- **Mortality (reduced calves for sale, removal costs)**
- **Feed intake costs: cow and calf**
- **Cow costs: infertility, Vets**
- **Sale price**
  - **Off-farm**
  - **Mart price**
    - **Depends on weight and quality**
- **Factory: Carcass weight, conformation fat**

What information is available to evaluate animals in Ireland

Depends on:

1) Structure of the suckler herd

- **Pedigree vs commercial**
- **Export live vs slaughter**

2) Database links to the breeding industry

- **Herds**
- **Department movements database (AIM)**
- **Marts**
- **Factories**
- **Tully performance test station**

Structure of the Suckler herd

- **Irish Suckler Beef production is dominated by crossbred cow herds**

Type of Calving herd on ICBF database	Count of herds	Count of cows calved	Averages no. of cows per type of herd		Count of calving herds in various categories of herd size (total beef cows only)					
			pedigree	crossbred	<5	5 to 9	10 to 24	25 to 49	50 to 99	>100
Crossbred beef cows only	40,482	503,270	0	12	10,786	10,328	14,439	4,238	651	40
Pedigree beef & crossbred beef cows	5,905	126,512	4	17	385	1,036	2,704	1,375	382	23
Pedigree beef, crossbred beef & dairy cows	967	17,712	4	14	135	227	377	168	52	8
Pedigree beef cows only	702	5,028	7	0	366	171	135	29	1	0
Pedigree beef & dairy cows	214	1,061	5	0	146	38	24	5	1	0

Focusing solely on pedigree herd data for genetic progress would exclude huge volumes of crossbred calving, weanling carcass and cow data

Summary of data in ICBF evaluations

Trait	Number of records evaluated	Source of information	% crossbreds in evaluations	Farmer input
Calving difficulty	4,175,040	On-farm, Animal Events	93%	Optional
Gestation	368,345	On-farm, Animal Events	75%	Optional
Mortality	4,107,160	On-farm, Animal Events	93%	Database linkup
150-300 day weight	532,550	On-farm, Marts	90%	Optional
300-600 day weight	570,795	On-farm, Marts	91%	Optional
Mart price per kg	325,134	Marts	100%	Database linkup
Calf quality score	616,165	On-farm, Suckler Welfare scheme	95%	Optional
Docility score	662,463	On-farm, Suckler Welfare scheme	83%	Optional
Linear scores	144,628	On-farm,Tully performance centre	23%	Optional
Feed intake	3,971	Tully performance centre	0%	Database linkup
Carcass (weight, grade, fat)	1,412,415	Abbatoirs, DAFF	98%	Database linkup
Age first calving	405,047	On-farm, AIM	78%	Database linkup
Calving interval	1,196,501	On-farm, AIM	65%	Database linkup
Survival	1,512,813	On-farm, AIM	63%	Database linkup
Maternal wean weight	158,796	On-farm, Marts	89%	Optional
Cull cow carcass weight	148,251	Abbatoirs, DAFF	60%	Database linkup
Birth weight	98,334	On-farm	9%	Optional
Cow docility	129,607	On-farm, Suckler cow survey	90%	Optional
Cow milkability	129,607	On-farm, Suckler cow survey	90%	Optional

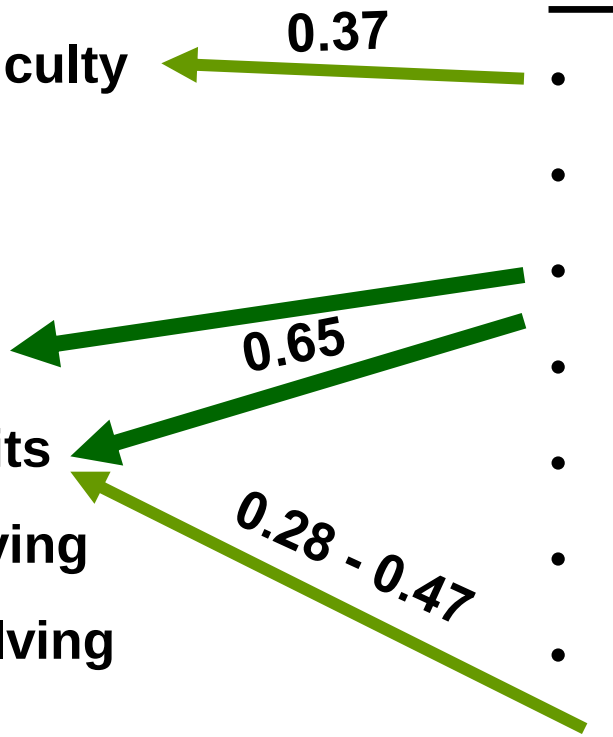
Use of all available information

Economic traits (10)

- Calving difficulty
- Gestation
- Mortality
- Feed intake
- Carcass traits
- Age 1st calving
- Maternal calving
- Milkability
- Fertility
- Cull cow value

Predictor traits (25)

- Birth weight
- Early liveweights
- Late liveweights
- Farmer Calf quality
- Calf price
- Weanling Mart price
- Store Mart price
- Muscle, Skeletal
- Cow live-weight
- Farmer milk scores
- Foreign ebv's



Genetic Differences in the Sucker herd (PTAs)

Trait/Index	Units of measurement and expression	Btm 1pc	50 pc	Top 1pc	Difference
Calving Difficulty	Scale of 1 to 4, expressed as % difficulty	16.5	5.5	1.4	15
Feed Intake	kg DM intake per day on test	0.5	0.0	-0.5	1.03
Carcass Weight	Kilograms	-6.0	18.3	36.7	43
Carcass Conformation	EUROP scale changed to 1 to 15	0.3	1.6	2.3	2.02
Age 1st Calving	Birth to first calving	20.3	-7.0	-38.4	59
Daughter Calving Difficulty	Scale of 1 to 4, expressed as % difficulty	10.8	6.4	3.6	7
Calving Interval	Days between calvings	5.3	-0.2	-6.7	12
Milk	Kilograms of weaning weight	-11.3	0.5	18.9	30
Cull Cow Carcass Weight	Kilograms	-15.8	21.4	45.7	61

Terminal, Maternal & Dairy-Beef €uro-Star Indexes explained

A) Terminal Index – Traits

Traits	Relative emphasis %
Calving difficulty, gestation, mortality	29.3%
weanling docility	2.4%
Feed intake	18.4%
Carcass weight, conformation, fat	49.8%

- Unlike the Weanling Export and Beef Carcass the cost of calving is now integrated

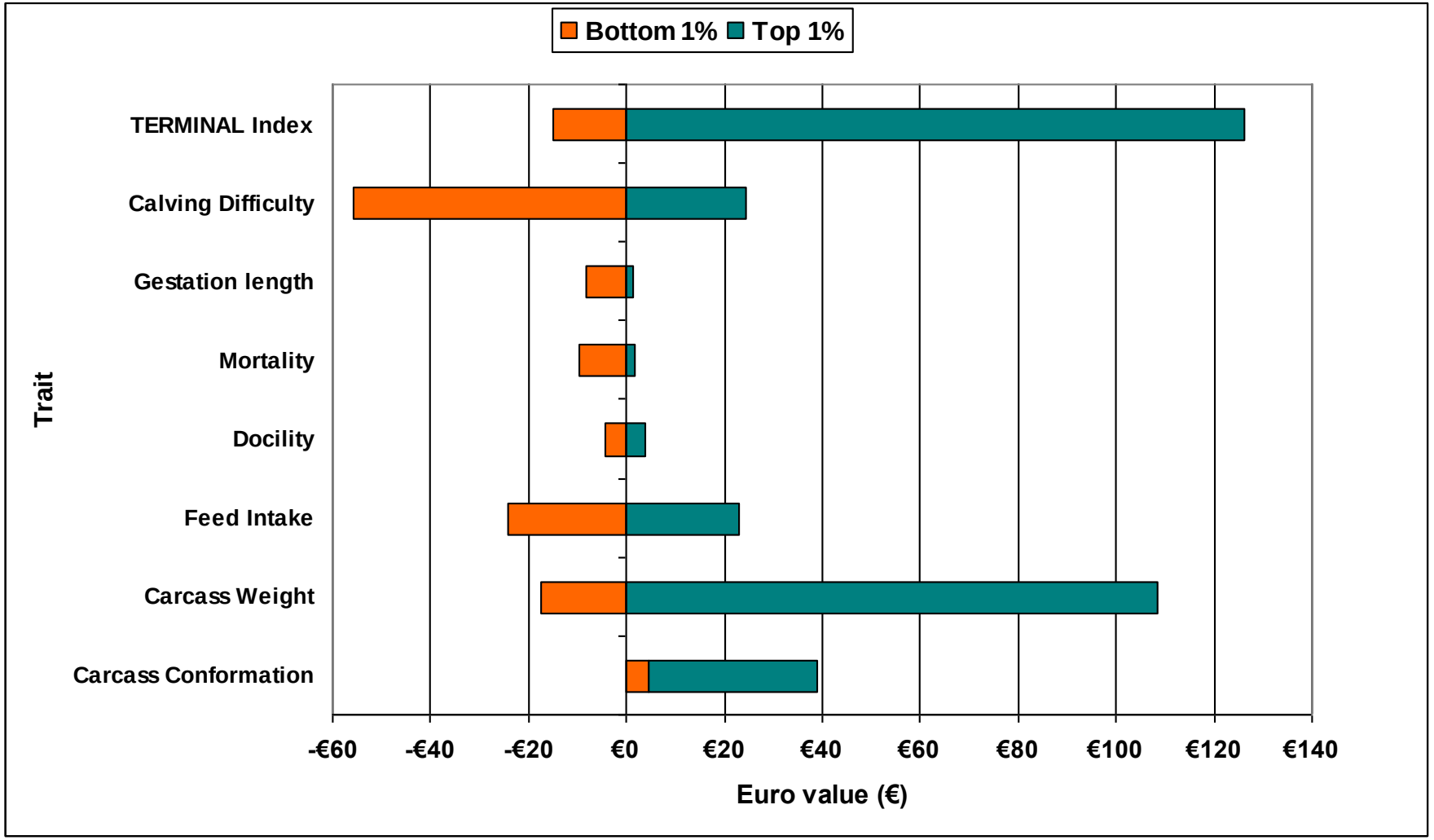
Terminal index example

- Terminal index = €125 (more profit per progeny slaughtered).
- Exceptional weight, grade and feed efficiency.
- Watch calving & maternal.

Star Rating (within Limousin breed)	Economic Indexes	€uro value per progeny	Index reliability	Star Rating (across all beef breeds)
★	Maternal	€57	50% (Average)	★½
★★★★★	Terminal	€125	55% (Average)	★★★★★
	Dairy Beef	€	% (N/A)	

Star Rating (within Limousin breed)	Key profit traits	Index value	Trait reliability	Star Rating (across all beef breeds)
	Expected progeny performance			
★★½	Calving difficulty (% 3 & 4) Breed ave: 5.33%, All breeds ave: 5.49%	5.38%	79% (High)	★★★
★★★★★	Docility (1-5 scale) Breed ave: -0.06, All breeds ave: 0.00	0.22 scale	60% (High)	★★★★★
★★★★★	Carcass weight (kg) Breed ave: 18.61kg, All breeds ave: 18.25kg	28.53kg	49% (Average)	★★★★½
★★★★★	Carcass conformation (1-15 scale) Breed ave: 1.79, All breeds ave: 1.57	2.38 scale	52% (Average)	★★★★★
	Expected daughter breeding performance			
½	Daughter calving difficulty (% 3 & 4) Breed ave: 5.90%, All breeds ave: 6.36%	7.74%	44% (Average)	★½
½	Daughter milk (kg) Breed ave: -0.31kg, All breeds ave: 0.47kg	-13.75kg	52% (Average)	½
½	Daughter calving interval (days) Breed ave: 1.27 days, All breeds ave: -0.20 days	6.83days	33% (Low)	½

Impact of trait PTAs on the Terminal Index



(B) Maternal Index – Relative emphasis for key traits.

Trait type	Trait	Relative emphasis %
Calving traits	Calving difficulty (direct and maternal), gestation, mortality	21%
Docility	Weanling and cow docility	4%
Beef	Carcass weight, conformation and fat, cull cow wt	26%
Milk	Daughter Milkability	9%
Fertility	Age 1st Calving, calving interval, survival	17%
Feed intake	Weanling, replacement heifer and cow intake	23%

Maternal Index example

Star Rating (within Limousin breed)	Economic Indexes	€uro value per progeny	Index reliability	Star Rating (across all beef breeds)
★★★★★	Maternal	€282	82% (Very High)	★★★★★
★★★★★	Terminal	€121	89% (Very High)	★★★★★
☆☆☆☆☆	Dairy Beef	€	% (N/A)	☆☆☆☆☆

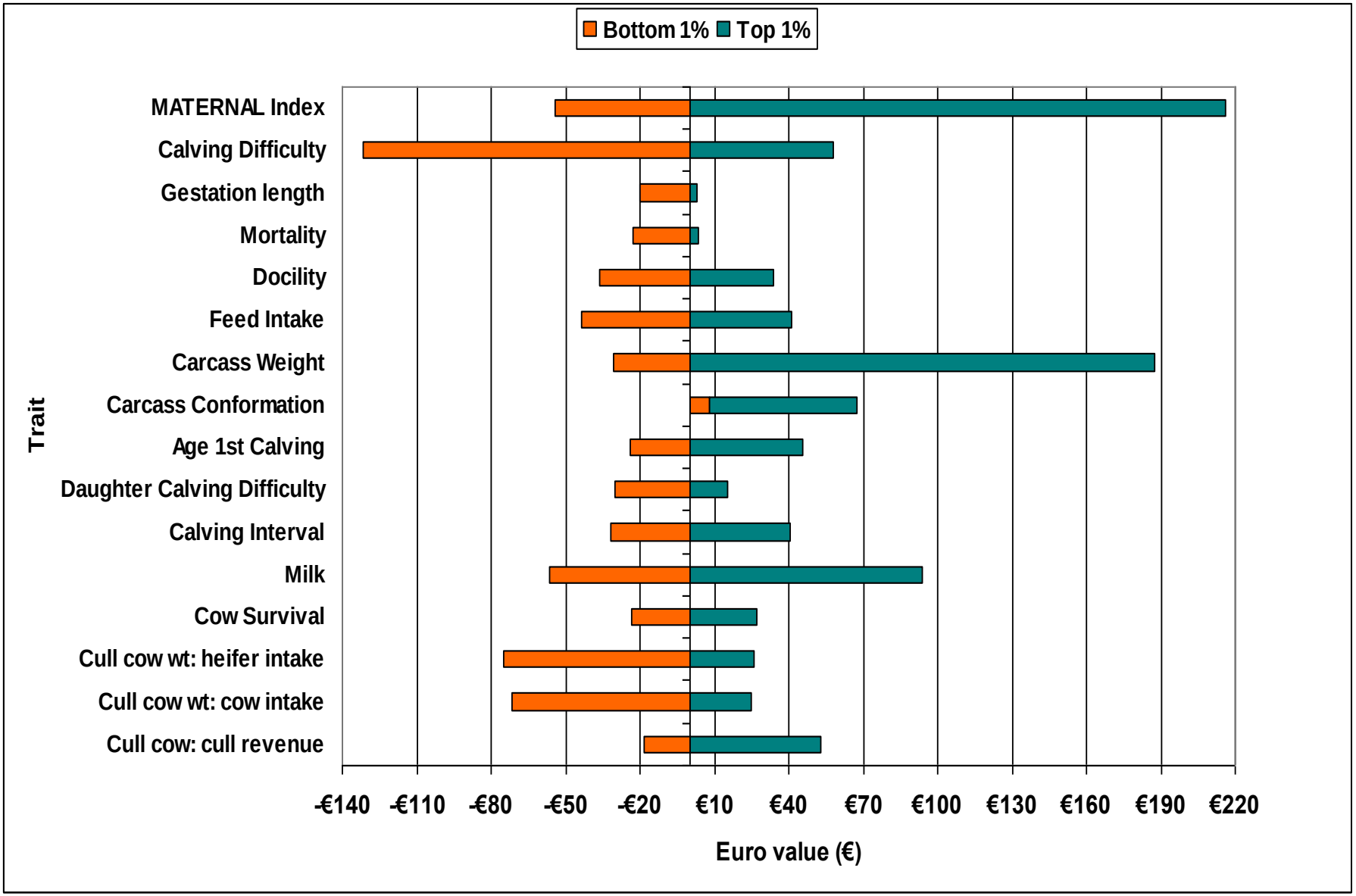
Star Rating (within Limousin breed)	Key profit traits	Index value	Trait reliability	Star Rating (across all beef breeds)
	Expected progeny performance			
★★★★½	Calving difficulty (% 3 & 4) Breed ave: 5.33%, All breeds ave: 5.49%	4.20%	95% (Very High)	★★★★☆
★★★☆☆	Docility (1-5 scale) Breed ave: -0.06, All breeds ave: 0.00	-0.05 scale	90% (Very High)	★★☆☆☆
★★★★½	Carcass weight (kg) Breed ave: 18.61kg, All breeds ave: 18.25kg	22.93kg	93% (Very High)	★★★½☆
★½☆☆☆	Carcass conformation (1-15 scale) Breed ave: 1.79, All breeds ave: 1.57	1.67 scale	94% (Very High)	★★★½☆
	Expected daughter breeding performance			
★★★★★	Daughter calving difficulty (% 3 & 4) Breed ave: 5.90%, All breeds ave: 6.36%	4.62%	72% (High)	★★★★★
★★★★★	Daughter milk (kg) Breed ave: -0.31kg, All breeds ave: 0.47kg	21kg	74% (High)	★★★★★
★★★★½	Daughter calving interval (days) Breed ave: 1.27 days, All breeds ave: -0.20 days	-.04days	59% (Average)	★★½☆☆

Maternal index = €282

€282 more profit per replacement female compared to bull with value of zero.

Expressed over animals life-time

Impact of trait PTAs on Maternal index



Dairy Beef Index

- Still under construction.
- Key traits; Calving difficulty, gestation length, beef merit, stock bull functionality *(new trait).*
- Available later this year.

Do the indexes work?

Calving stats by breed

Breed	AA	HE	LM	SI	CH	BB
Number of sires	9,822	5,389	19,999	4,344	24,122	1,966
scored 1	83%	78%	83%	80%	79%	71%
scored 2	14%	18%	14%	16%	17%	22%
scored 3	2%	3%	2%	2%	3%	5%
scored 4	1.2%	1.3%	1.2%	1.4%	1.5%	2.8%
% parity 1 dams	39%	18%	20%	14%	8%	7%
% dairy in dams	58%	59%	20%	23%	14%	24%
% pure bred calvings	7%	9%	6%	10%	6%	4%
Predicted CD%	1.9	3.8	4.4	5.4	6.9	9.2

The majority of information on calving difficulty is coming from commercial dairy and beef herds

If farmers want accurate indexes when they buy a bull then record the calving difficulties accurately!

Table 1. Calving difficulty based on €uro-star rating

Across breed star ranking	Number of sires	Average CD%	average number of calves	% parity 1 dams	% dairy in dams	% pure bred calving's
5	8,444	1.4	71	36%	55%	6%
2.5	5,263	5.3	68	17%	20%	6%
0.5	5,859	10.6	110	7%	16%	9%
	19,566					

Table 2. Percentage scores based on €uro-star rating

Across breed star ranking	score of 1 (no assistance)	scored of 2 (slight assistance)	scored 3 (hard pull)	scored 4 (c-section)
5	87%	11%	2%	1%
2.5	82%	15%	2%	1%
0.5	64%	26%	6%	4%

An example of evaluations at work

Farmer score	Bull A	Bull B
1: Unassisted	83%	83%
2: Slight assistance	14%	14%
3: Considerable difficulty	2%	2%
4: Caesarean section	1%	1%

The 2 bulls look to have the same level of calving difficulty

Type of cow	Used on dairy heifers calving at 2 y.o.	Used on mature sucker cows

Genetic evaluations account for: breed of dam, herd the bull was used in, birth year, sex of the calf, heterosis in the calf, parity of dam

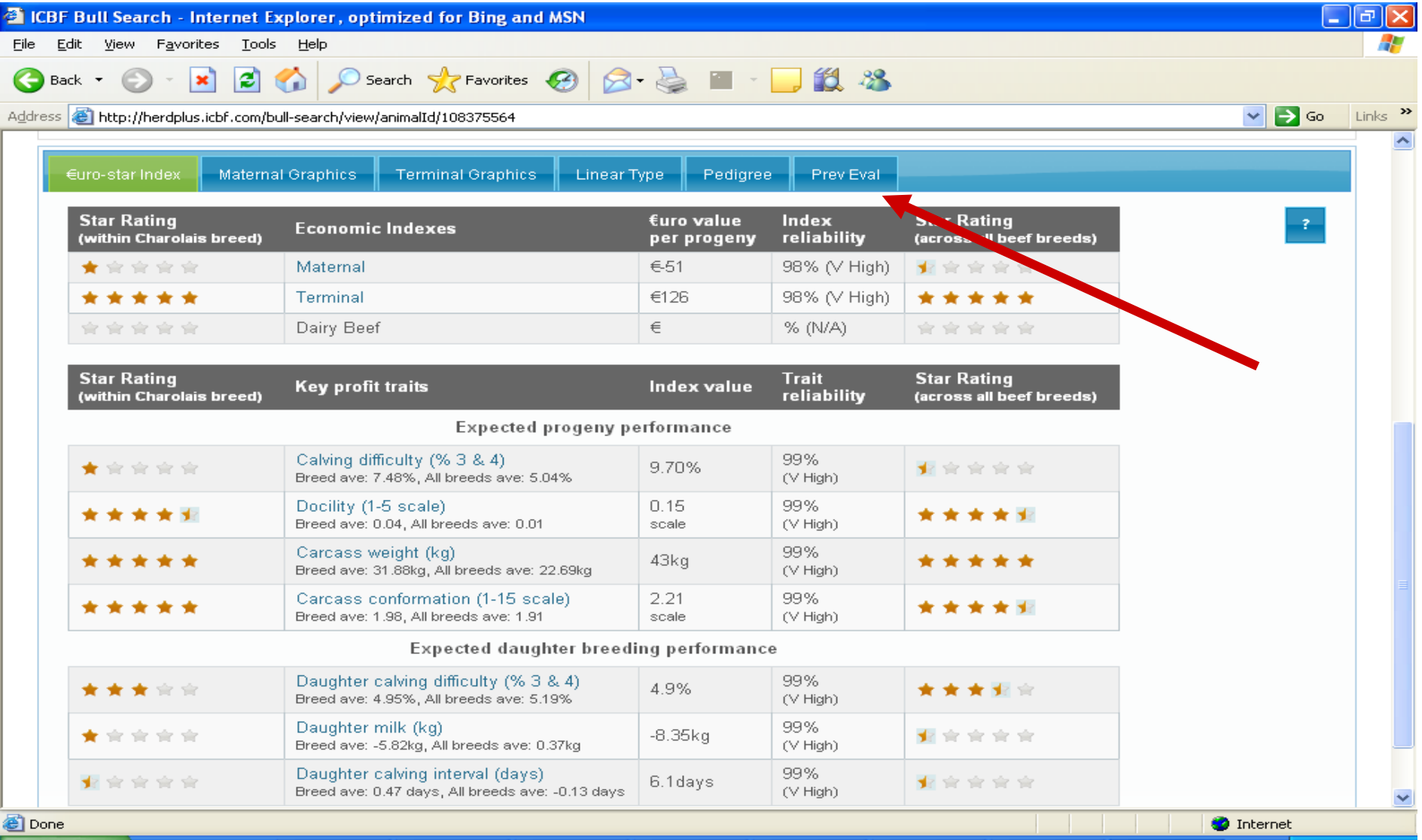
Predicted calving difficulty	1.9	4.4

Lisnagree Elite example

	Star Rating Charolais			LGL
within breed star ranking	5	2.5	0.5	0.5
Number of sires	4,476	1,911	1,653	
Average CD%	4.6	7.7	11.8	10.40%
average reliability	60%	59%	62%	96%
Min number of calves for a sire	10	10	10	
average number of calves	62	66	105	1188
Max number of calves for a sire	9,959	17,801	9,069	
% parity 1 dams	9.4%	8.3%	6.0%	3.40%
Average parity of dams	5.2	5.1	4.9	
% dairy in dams	13.9%	12.6%	13.4%	8%
% pure bred calvings	4%	5%	11%	22%
scored 1	90%	77%	59%	75%
scored 2	8%	18%	29%	18%
scored 3	1%	3%	8%	4%
scored 4	1%	2%	3%	3%

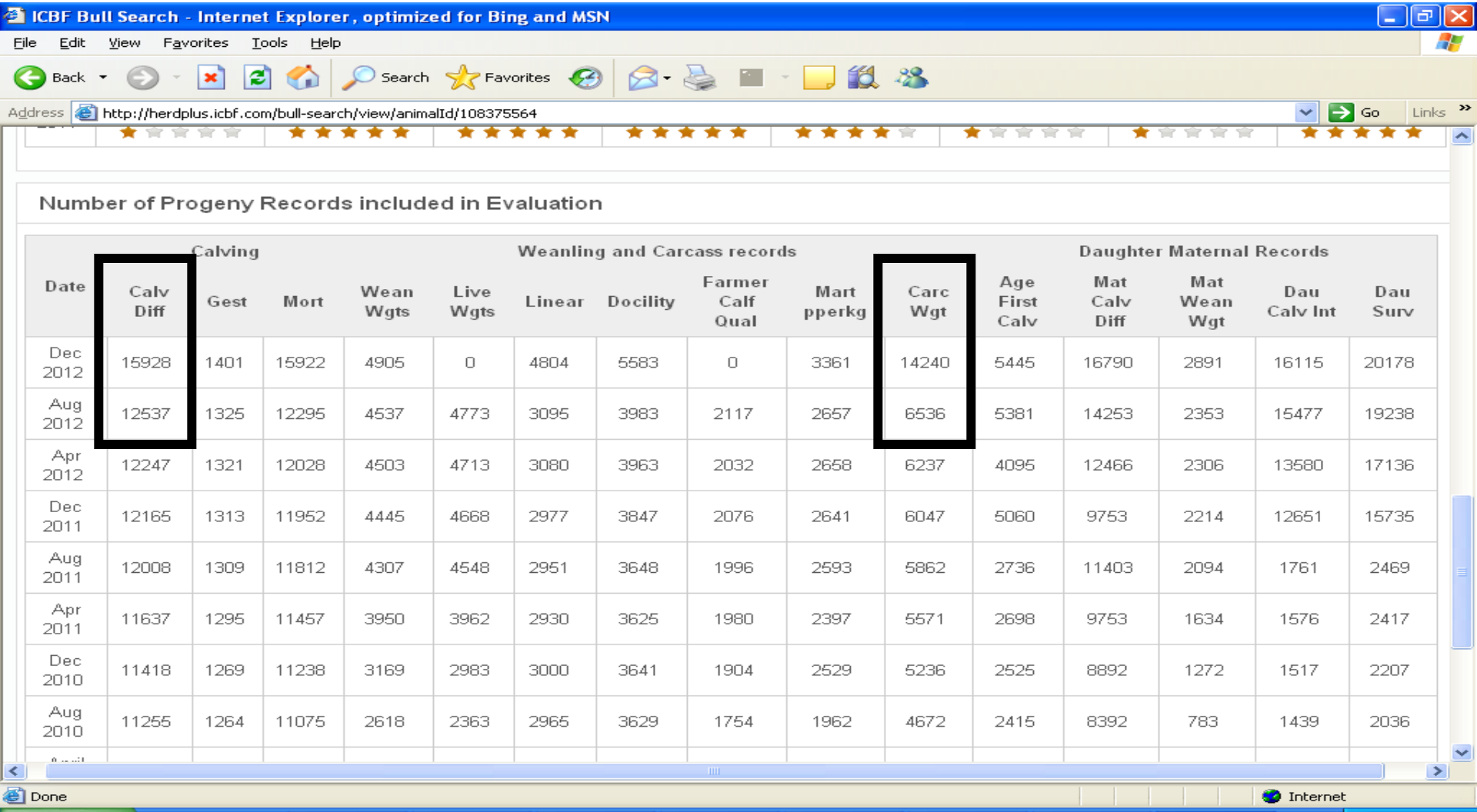
What is a fully proven bull?

- >90% for all traits : Not many bulls there yet



What is a fully proven bull

- >90% for all traits : Not many there yet



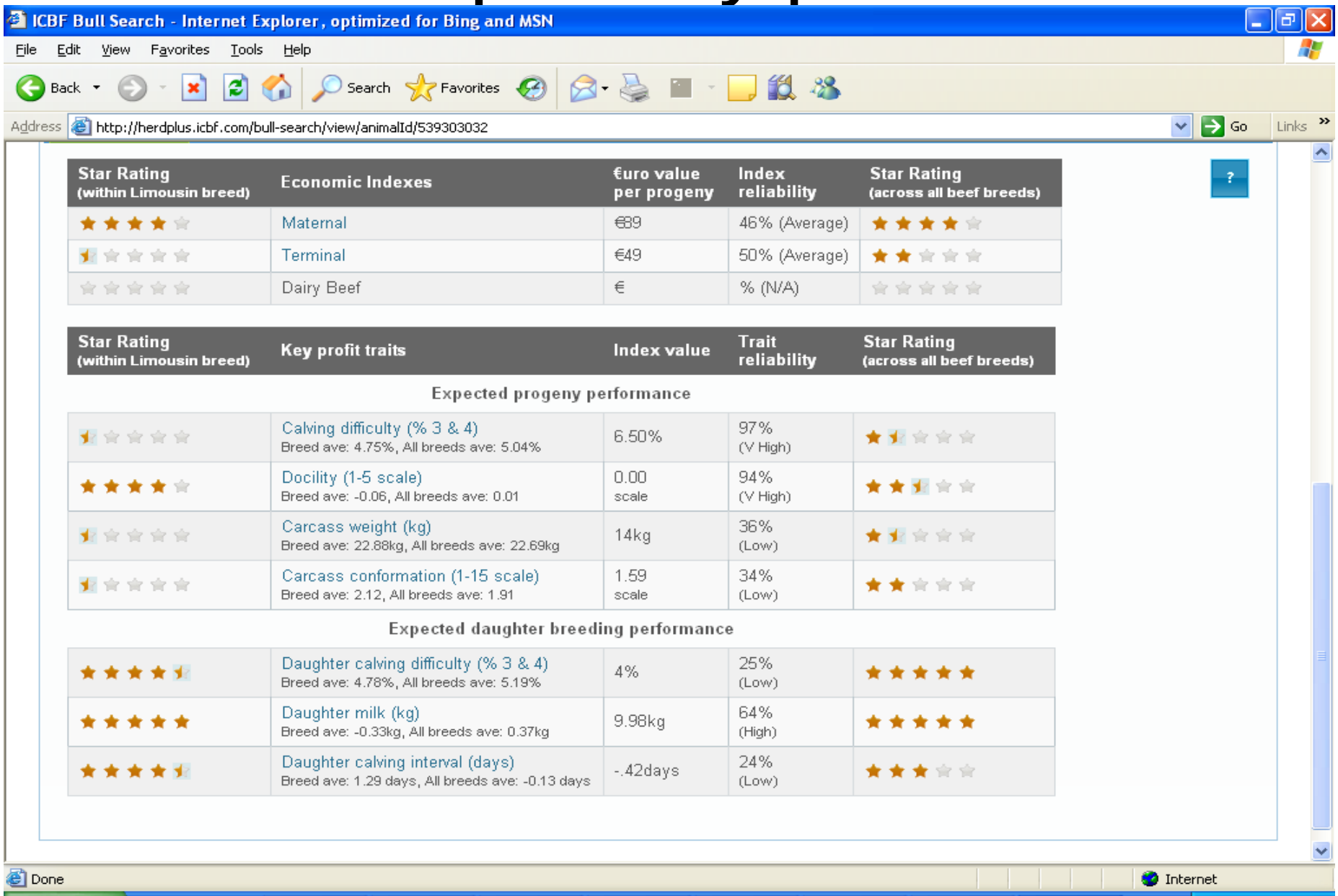
Number of Progeny Records included in Evaluation

Date	Calving			Weanling and Carcass records							Daughter Maternal Records				
	Calv Diff	Gest	Mort	Wean Wgts	Live Wgts	Linear	Docility	Farmer Calf Qual	Mart pperkg	Carc Wgt	Age First Calv	Mat Calv Diff	Mat Wean Wgt	Dau Calv Int	Dau Surv
Dec 2012	15928	1401	15922	4905	0	4804	5583	0	3361	14240	5445	16790	2891	16115	20178
Aug 2012	12537	1325	12295	4537	4773	3095	3983	2117	2657	6536	5381	14253	2353	15477	19238
Apr 2012	12247	1321	12028	4503	4713	3080	3963	2032	2658	6237	4095	12466	2306	13580	17136
Dec 2011	12165	1313	11952	4445	4668	2977	3847	2076	2641	6047	5060	9753	2214	12651	15735
Aug 2011	12008	1309	11812	4307	4548	2951	3648	1996	2593	5862	2736	11403	2094	1761	2469
Apr 2011	11637	1295	11457	3950	3962	2930	3625	1980	2397	5571	2698	9753	1634	1576	2417
Dec 2010	11418	1269	11238	3169	2983	3000	3641	1904	2529	5236	2525	8892	1272	1517	2207
Aug 2010	11255	1264	11075	2618	2363	2965	3629	1754	1962	4672	2415	8392	783	1439	2036

Key profit traits – CF52

Date	Calving Diff (%)	Docility (1-5 scale)	Carcass Wgt (kg)	Carc Conf (1-15 scale)	Dau Calv Diff (%)	Dau Milk (kg)	Dau Calv Int (days)	Feed Intake (kg)
Dec 2012	9.70% (99%)	0.15 scale (99%)	43kg; 99%	2.21 scale 99%	4.90% (99%)	-8.35kg (99%)	6.1 days (99%)	0.37kg (91%)
Aug 2012	11.08% (99%)	0.13 scale (99%)	37.53kg; 99%	1.83 scale 99%	5.22% (99%)	-8.70kg (99%)	6.11 days (99%)	-0.22kg (97%)
Apr 2012	11.33% (99%)	0.13 scale (99%)	37.2kg; 99%	1.83 scale 99%	5.22% (99%)	-8.64kg (10%)	6.53 days (99%)	-0.22kg (97%)
Dec 2011	10.98% (99%)	0.14 scale (99%)	37.14kg; 99%	1.82 scale 99%	5.23% (99%)	-8.81kg (99%)	7.07 days (98%)	-0.22kg (97%)

What is a partially proven bull?



Star Rating (within Limousin breed)	Economic Indexes	€uro value per progeny	Index reliability	Star Rating (across all beef breeds)
★★★★☆	Maternal	€89	46% (Average)	★★★★☆
½☆☆☆☆	Terminal	€49	50% (Average)	★★☆☆☆
☆☆☆☆☆	Dairy Beef	€	% (N/A)	☆☆☆☆☆

Star Rating (within Limousin breed)	Key profit traits	Index value	Trait reliability	Star Rating (across all beef breeds)
Expected progeny performance				
½☆☆☆☆	Calving difficulty (% 3 & 4) Breed ave: 4.75%, All breeds ave: 5.04%	6.50%	97% (V High)	★½☆☆☆
★★★★☆	Docility (1-5 scale) Breed ave: -0.06, All breeds ave: 0.01	0.00 scale	94% (V High)	★★½☆☆
½☆☆☆☆	Carcass weight (kg) Breed ave: 22.88kg, All breeds ave: 22.69kg	14kg	36% (Low)	★½☆☆☆
½☆☆☆☆	Carcass conformation (1-15 scale) Breed ave: 2.12, All breeds ave: 1.91	1.59 scale	34% (Low)	★★☆☆☆
Expected daughter breeding performance				
★★★★½	Daughter calving difficulty (% 3 & 4) Breed ave: 4.78%, All breeds ave: 5.19%	4%	25% (Low)	★★★★★
★★★★★	Daughter milk (kg) Breed ave: -0.33kg, All breeds ave: 0.37kg	9.98kg	64% (High)	★★★★★
★★★★½	Daughter calving interval (days) Breed ave: 1.29 days, All breeds ave: -0.13 days	-.42days	24% (Low)	★★★☆☆

Number of Progeny Records included in Evaluation

Date	Calving			Weanling and Carcass records							Daughter Maternal Records				
	Calv Diff	Gest	Mort	Wean Wgts	Live Wgts	Linear	Docility	Farmer Calf Qual	Mart pperkg	Carc Wgt	Age First Calv	Mat Calv Diff	Mat Wean Wgt	Dau Calv Int	Dau Surv
Dec 2012	1547	392	948	127	0	10	175	0	65	1	0	0	0	0	0
Aug 2012	680	280	694	1	0	0	0	0	1	0	0	0	0	0	0
Apr 2012	11	5	9	1	0	0	0	0	1	0	0	0	0	0	0
Dec 2011	2	0	0	0					0	0	0	0	0	0	0
Aug 2011															
Apr 2011															
Dec 2010															
Aug 2010															
April 2010															

Number of Progeny Records included in Evaluation

	Calving			Weanling and Carcass records							Daughter Maternal Records				
Date	Calv Diff	Gest	Mort	Wean Wgts	Live Wgts	Linear	Docility	Farmer Calf Qual	Mart pperkg	Carc Wgt	Age First Calv	Mat Calv Diff	Mat Wean Wgt	Dau Calv Int	Dau Surv
Dec 2012	1547	392	948	127	0	10	175	0	65	1	0	0	0	0	0
Aug 2012	680	280	694	1	0	0	0	0	1	0	0	0	0	0	0
Apr 2012	11													0	0
Dec 2011	2													0	0
Aug 2011															
Apr 2011															
Dec 2010															
Aug 2010															
April 2010															

	run	no progeny	no herd mates	av wt of progeny	av wt of herd mates	av age	hysmate age
150-250 wt	Dec-12	127	556	277	296	207	209
250-350 wt	Dec-12	22	53	275	309	267	281
350-450 wt	Dec-12	2	3	398	418	402	399

		run	no progeny	no herd mates	av price of progeny	av price of herd mates
Mart price	150-300 days	Dec-12	65	190	€691	€770

EBV Updated on **18/02/2013** Print on **27/02/2013**

Breed Limousine — OZEUS

Herdbook qualification **RRE QM** N° **FR 1519127770** DNA number COLA1011

Idele n° 34-54274

born on 10/10/1998
Birth herd GAEC DES MYOSOTIS (PORTAL
project management : **France Limousin Testage**

sire	FR 1293111663	IDOLE	PGS	FR 1991000217	GEANT	(34)
	Breed 34		PGD	FR 1288110194	DIRECTRIC	(34)
dam	FR 1594060479	JENNY	MGS	FR 2383055260	ULEX	(34)
	Breed 34		MGD	FR 1592053293	HIRONDELL	(34)

Authorised for progeny testing Maternal progeny station **le 26/02/2001**
Not approved Approved for Beef progeny test station **le 10/07/2003**
Approved for Maternal progeny **le 19/11/2004**

Calving ease
reference **LLPF.12**
IFNAIS 102 CD 0,99

2.5 STAR

IBOVAL

reference **LLPF.12** rank evaluation **01** (EBV in 100 base)

CRsev	DMsev	DSsev	FOSsev	ISEVR	CD	AVel	ALait	MERPsev	IVMAT	CD
103	111	100	103	**111**	**0,99**	106	107	108	**117**	**0,95**

DEE	LAD	ARC	LAC	EPD	GRC	LOD	LOB	LAH	DEV	TET	AAV	AAR	RED	PPO	LAP	LAT	LOC	ETA
++	+	++	++	++	=	=	=	++	=	++	---	+	--	+	+	++	+++	=

Nb of active campaign : 9
Number of Herds : 1363
Number of Calves : 3557
Number of Dtrs : 469

Beef progeny on-farm testing

reference **LLPF.12** rank evaluation **01** (EBV in 100 base)

(suffix 'jbf')	ICRC	CD	CONF	CD	IAB	CD
	111	0,97	102	0,95	**110**	**0,96**

IAB euros : 29,0€ nb of young cattle :

Own performance station

reference **LLCL12** (EBV in 100 base)

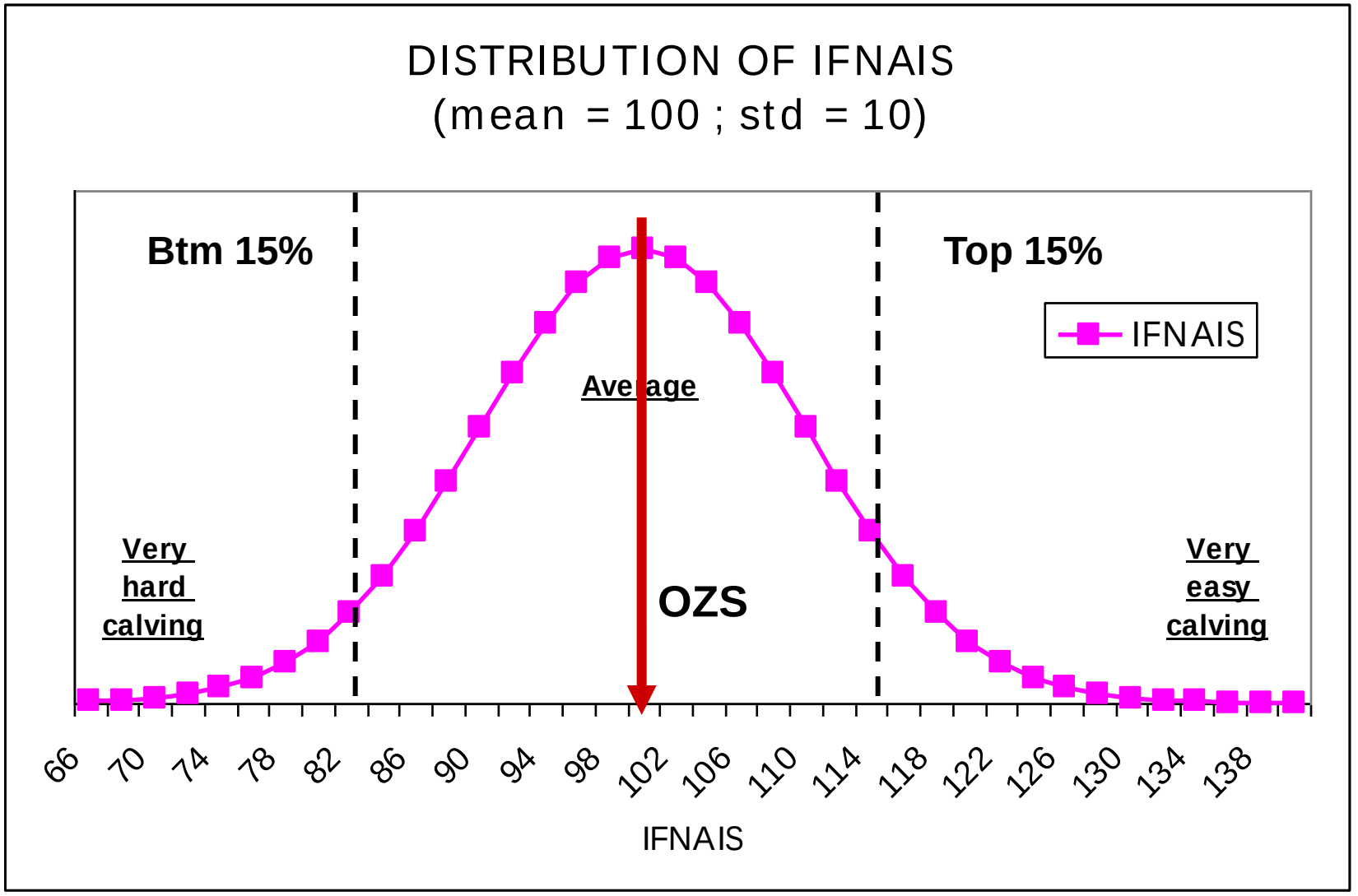
(suffix 'ci')	CR	DM	EFA	IABV	CD	DS	OP	AF	QR	IMOCR	CD
	104	110	104	**109**	**0,59**	96		95	95	**110**	**0,54**

Beef progeny test station

reference **LLQM12** serial n° **18** (EBV in 100 base)

(suffix 'jbs')	CR	DM	DS	AF	QR	IABV	CD	PCAR	RDT	CONF	CEC	CDC	CAC	CCU	CCA	GRAS	IAB	CD
	91	99	88	94	81	**95**	**0,71**	96	114	96	101	100	93	100	95	96	**97**	**0,68**

Calving ease range in French indexes



Calving Difficulty (% of calvings scored as 3 or 4)

Ranking information

Date of Evaluation	Percentile Rank within breed	Star rating within Breed	PTA	Reliability	Percentile Rank across Breed	Star rating across all Breeds
Dec 2012	9	★½☆☆☆	6.50	97	28	★½☆☆☆
Aug 2012	8	★½☆☆☆	7.84	97	23	★½☆☆☆

Sire Progeny and Progeny Herdmate Information

Date of Evaluation	No. of Births	Herd Mate Births	Scored 3 or 4 (%)	Herd Mate Scored 3 or 4 (%)	Male Births	1st Parity		2nd Parity		3rd parity	
						Records	Scored 3 or 4 (%)	Records	Scored 3 or 4 (%)	Records	Scored 3 or 4 (%)
Dec 2012	1547	4012	8	6	776 (50%)	1027	10%	179	4%	341	4%
Aug 2012	680	4276	7	6	341 (50%)	386	9%	100	5%	194	4%

Information on Dams of Progeny (Cows mated to the sire)

Date of Evaluation	Avg PTA Calving Difficulty	Average % in Dams By Breed								
		AA	BA	BB	CH	FR	HE	HO	LM	SI
Dec 2012	-1	6%	0%	6%	14%	2%	4%	13%	31%	11%
Aug 2012	-1	7%	0%	7%	15%	2%	5%	13%	27%	9%

EBV Updated on **18/02/2013** Print on **27/02/2013**

Breed Limousine — OZEUS

Herdbook qualification **RRE QM** N° **FR 1519127770** DNA number COLA1011

Idele n° 34-54274

born on 10/10/1998
Birth herd GAEC DES MYOSOTIS (PORTAL
project management : **France Limousin Testage**

sire	FR 1293111663	IDOLE	PGS	FR 1991000217	GEANT	(34)
	Breed 34		PGD	FR 1288110194	DIRECTRIC	(34)
dam	FR 1594060479	JENNY	MGS	FR 2383055260	ULEX	(34)
	Breed 34		MGD	FR 1592053293	HIRONDELL	(34)

Authorised for progeny testing Maternal progeny station **le 26/02/2001**
Not approved Approved for Beef progeny test station **le 10/07/2003**
Approved for Maternal progeny **le 19/11/2004**

Calving ease reference **LLPF.12**
IFNAIS 102 CD 0,99

2.5 STAR

IBOVAL

reference **LLPF.12** rank evaluation **01** (EBV in 100 base)

CRsev	DMsev	DSsev	FOSsev	ISEVR	CD	AVel	ALait	MERPsev	IVMAT	CD
103	111	100	102	**111**	**0,99**	106	107	108	**117**	**0,95**

DEE	LAD	ARC	LAC	EPD	GRC	LOD	LOB	LAH	DEV	TET	AAV	AAR	RED	PPO	LAP	LAT	LOC	ETA
++	+	++	++	++	=	=	=	++	=	++	---	+	--	+	+	++	+++	=

Nb of active campaign : 9
Number of Herds : 1363
Number of Calves : 3557
Number of Dtrs : 469

Beef progeny on-farm testing

reference **LLPF.12** rank evaluation **01** (EBV in 100 base)

(suffix 'jbf')

ICRC	CD	CONF	CD	IAB	CD
111	0,97	102	0,95	**110**	**0,96**

IAB euros : 29,0€ nb of young cattle :

Own performance station

reference **LLCI.12** (EBV in 100 base)

(suffix 'ci')

CR	DM	EFA	IABV	CD	DS	OP	AF	QR	IMOCR	CD
104	110	104	**109**	**0,59**	96		95	95	**110**	**0,54**

Beef progeny test station

reference **LLQM.12** serial n° **18** (EBV in 100 base)

(suffix 'jbs')

CR	DM	DS	AF	QR	IABV	CD	PCAR	RDT	CONF	CEC	CDC	CAC	CCU	CCA	GRAS	IAB	CD
91	99	88	94	81	**95**	**0,71**	96	114	96	101	100	93	100	95	96	**97**	**0,68**

Importance of Tully

- 77 commercial progeny tested in Tully

	Final live-weight (kg)	Average daily gain (kg)	Dry matter intake (kg/day)	Feed conv efficiency (dmi/adg)
Highest	826	2.6	13.4	7.4
Lowest	558	1.2	8.6	4.4
Average	672	1.9	11.2	5.8

Rank on CSV*	Weight (kg)	Dry matter intake (kg DM day)	Average Daily Gain (kg/day)	Feed Efficiency
Top 1/3	**702**	**11.0**	**2.06**	**5.4**
Bottom 1/3	**687**	**11.0**	**1.93**	**5.9**

*Commercial slaughter value

The benefits of 5 star breeding.

€uro Stars	€uro Index
5 Stars	€87
4 Stars	€63
3 Stars	€50
2 Stars	€36
1 Stars	€10
Diff	**€77**

Weanling	
Wt kg	Value €
377	€727
358	€691
357	€676
350	€652
346	€645
	€82

Finisher		
Age	CWt kg	Value €
565	323	€1,204
571	311	€1,150
573	305	€1,111
578	297	€1,078
581	288	€1,038
		€166

Retailer		
HVC kg	VHVC kg	Value €
55.8	25.4	€1,820
53.6	24.7	€1,747
52.1	24.0	€1,703
49.6	23.1	€1,632
47.4	22.2	€1,559
		€261

- Economic indexes do work.
- There are exceptions (linked to reliability).

Data reliability.

- Focus on €uro-Stars, but also data reliability.
  - <20% = Very low = Stock bull, limited data and/or ancestry performance.
  - 21-40% = Stock bull, good data &/or ancestry performance.
  - 41-60% = Medium = AI sire &/or well proven stock bull.
  - 61-80% = High = Proven AI sire.
  - 81-100% = Very High = Well proven AI sire.

Example: carcass weight

category of old reliability	Number of sires	Maximum loss in cwt PTA	Maximum gain in cwt PTA	Average difference in cwt PTA	Impact of largest change		Average progeny carcass records Apr'12	Average number of extra carcasses in Sep'12	Maximum number of progeny carcass records
					Terminal index	Maternal index			
99% +	170	-0.8	1.0	0.2	€3	€5	1,443	92	15,144
80% to 98%	623	-6.3	7.6	0.2	€23	€39	60	3	398
65% to 80%	272	-10.7	7.8	0.3	-€32	-€55	7	0.2	20
50% to 65%	243	-7.0	15.7	0.7	€46	€80	2	0.1	9
Less than 50%	1012	-8.1	16.6	0.7	€49	€85	1	0.0	5

G€N€ IR€LAND bull breeder herds

- New developments in late 2012
  - Voluntary program for pedigree herds
  - High level of data recording based on 9 traits/events
  - Quality of data from their herds has been “independently” verified
  - Receive G€N€ IR€LAND bull breeding stamp once reach a high standard

Summary.

- New indexes will facilitate easier identification of bulls/cows for specific purposes.
  - Maternal, terminal & dairy beef.

- Importance of costs of production traits are apparent. These bulls (& breeds) have benefited from the new indexes.

- €uro-Star indexes have being shown to work at farm level.

- Remember to take into account the reliability behind the values.

Genetic evaluations
Do they work?

Noirin McHugh[1],
R Prendiville[1], D Minogue[1], A Cromie[2] and R Evans[2]

[1]Animal & Grassland Research and Innovation Centre, Teagasc, [2]ICBF

Background

- Accurate genetic evaluations are key to sustainable genetic gain
- Must be reflective of on-farm performance
- Suckler cow key to overall efficiency and profitability
- Recent industry figures from the ICBF, on average:
  - 30 months of age at first calving
  - 384 days calving interval
  - Producing 0.85 calves per cow per year

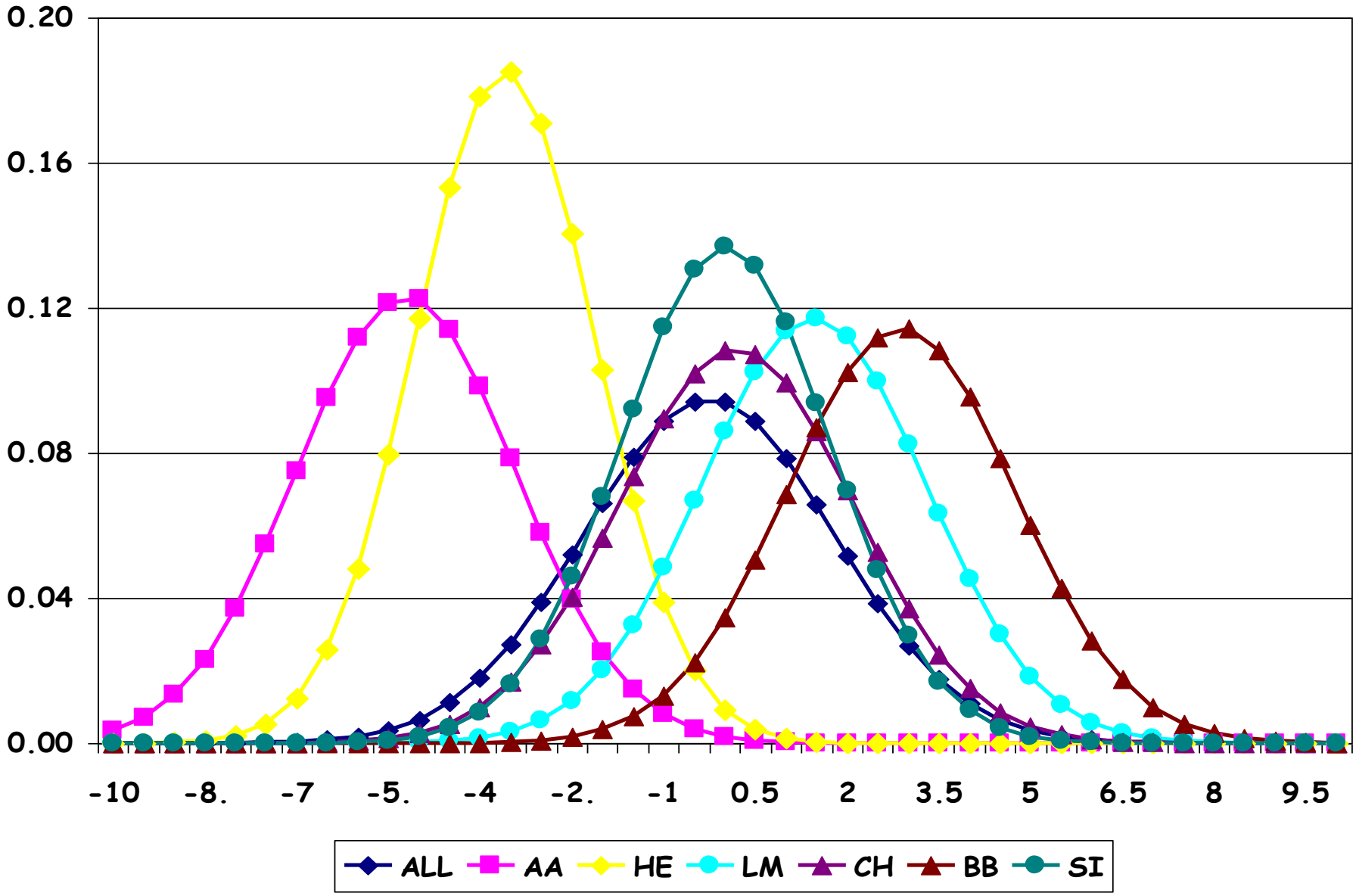
Not sustainable

- One potential solution accurate genetic evaluations

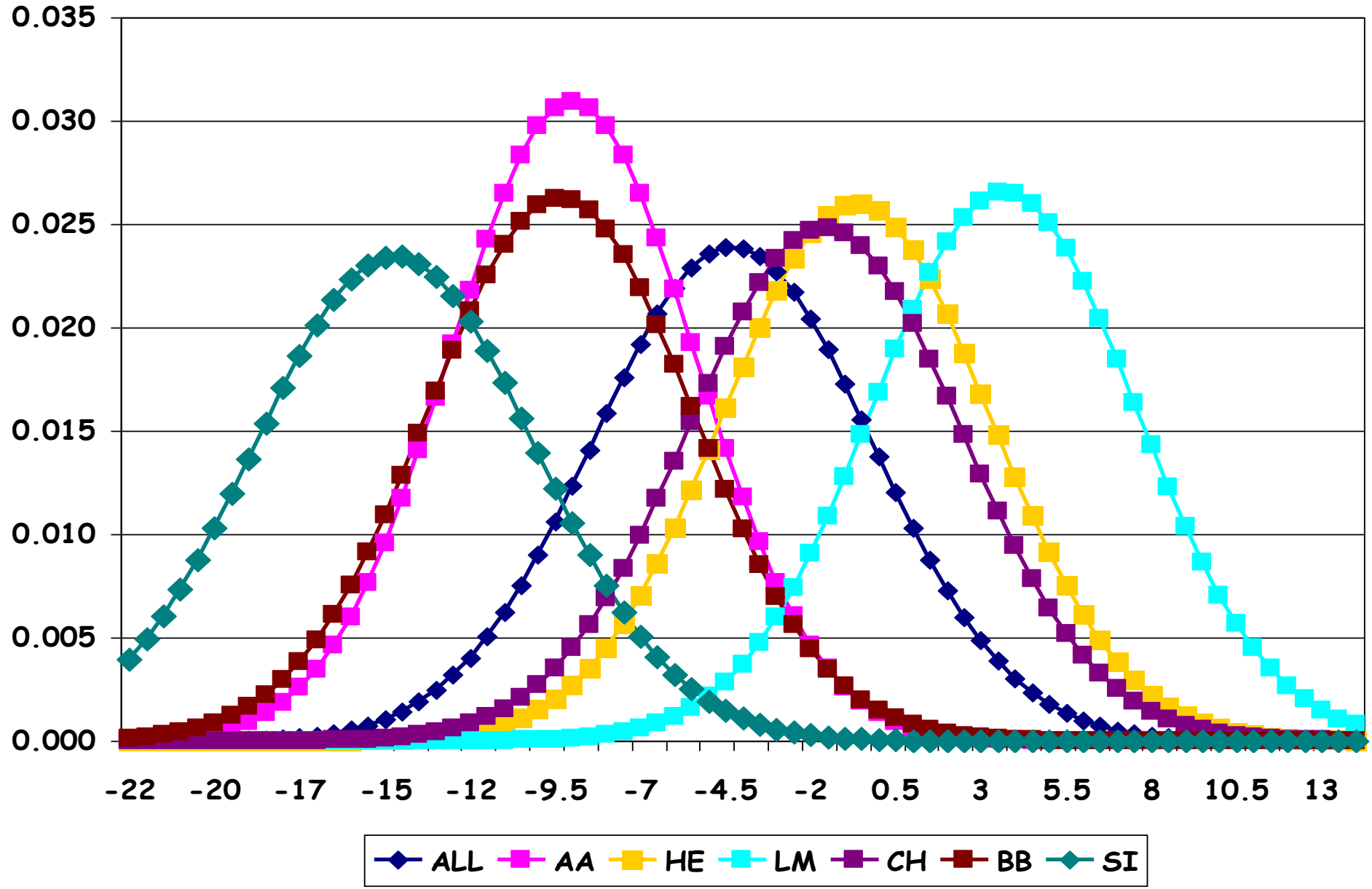
Importance of genetics

- Genetic gain is cumulative and permanent
- Misconception:
  1. Maternal traits not controlled by genetics
  2. Low heritability→ can't make improvements
  3. Differences in traits → breeds
- Reality:
  1. Combination of both genetics and management
  2. Low heritability ↑on-farm records required
  3. Genetic variation within & across breeds

Genetic variation – calving interval



Genetic variation – Age at first calving



How genetic evaluations work

Requirements:

1. Traits of key importance to profitability
2. Exploitable genetic variation
3. Routine accurately recorded on-farm data

How genetic evaluations work

- **Fertility:**
- Calving dates → age at first calving and calving intervals
- **Milk yield:**
- Predictor → live weight at weaning:
  1. **Direct weaning weight**
  - Potential of the calf to grow due to the parental genes
  2. **Maternal weaning weight**
  - Growth of the calf due to the milk yield
- Correlated traits → weight and cow milkability score

Do genetic evaluations work?

Previous studies…. Terminal traits

- Genetic evaluations carcass traits → reflected in differences in animal performance
- High beef carcass sub-index → greater profitability of progeny
  - Carcasses of progeny of high BCI sires were 14 kg heavier
  - Difference in profitability at slaughter:
    - €42 based on BCI
    - Actual diff €53

What about maternal traits?

- Can be tested by comparing:

1. Breeding values for maternal traits published by ICBF in April 2011

to

2. Performance of their subsequent offspring

- Only farm data after April 2011 was used

Maternal traits - Fertility

- Age at first calving
- Each unit increase in breeding value for AFC reduces age at first calving by 0.39 days
- Calving interval
- Each unit increase in breeding value for

Milk yield

5 Star Calf V's 1 Star Calf

Difference 18 kg at weaning

5 Star Dam V's 1 Star Dam

Difference 14 kg at weaning

Milk yield

5 Star Calf

18 kg heavier at weaning

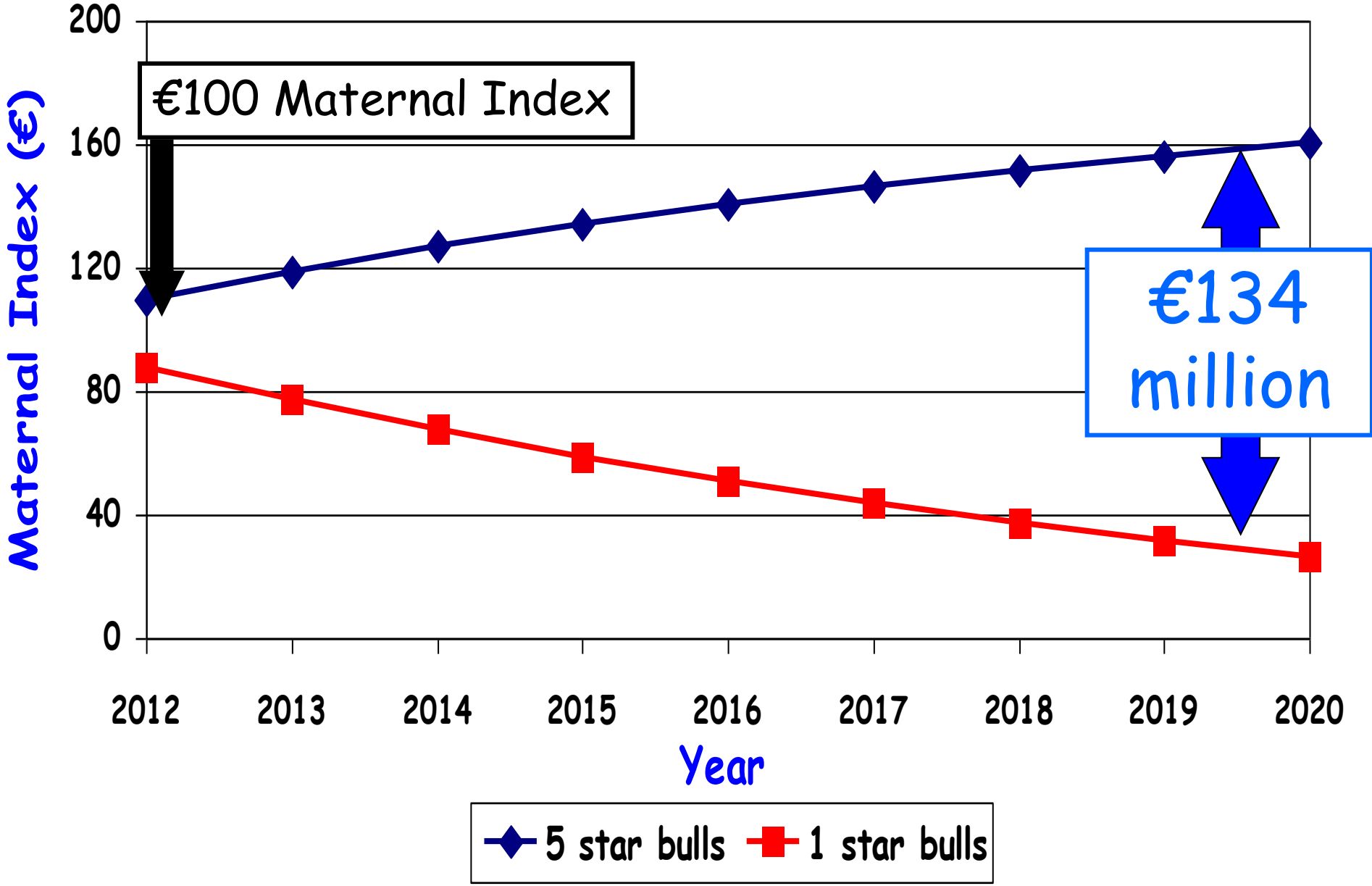
+

5 Star Dam

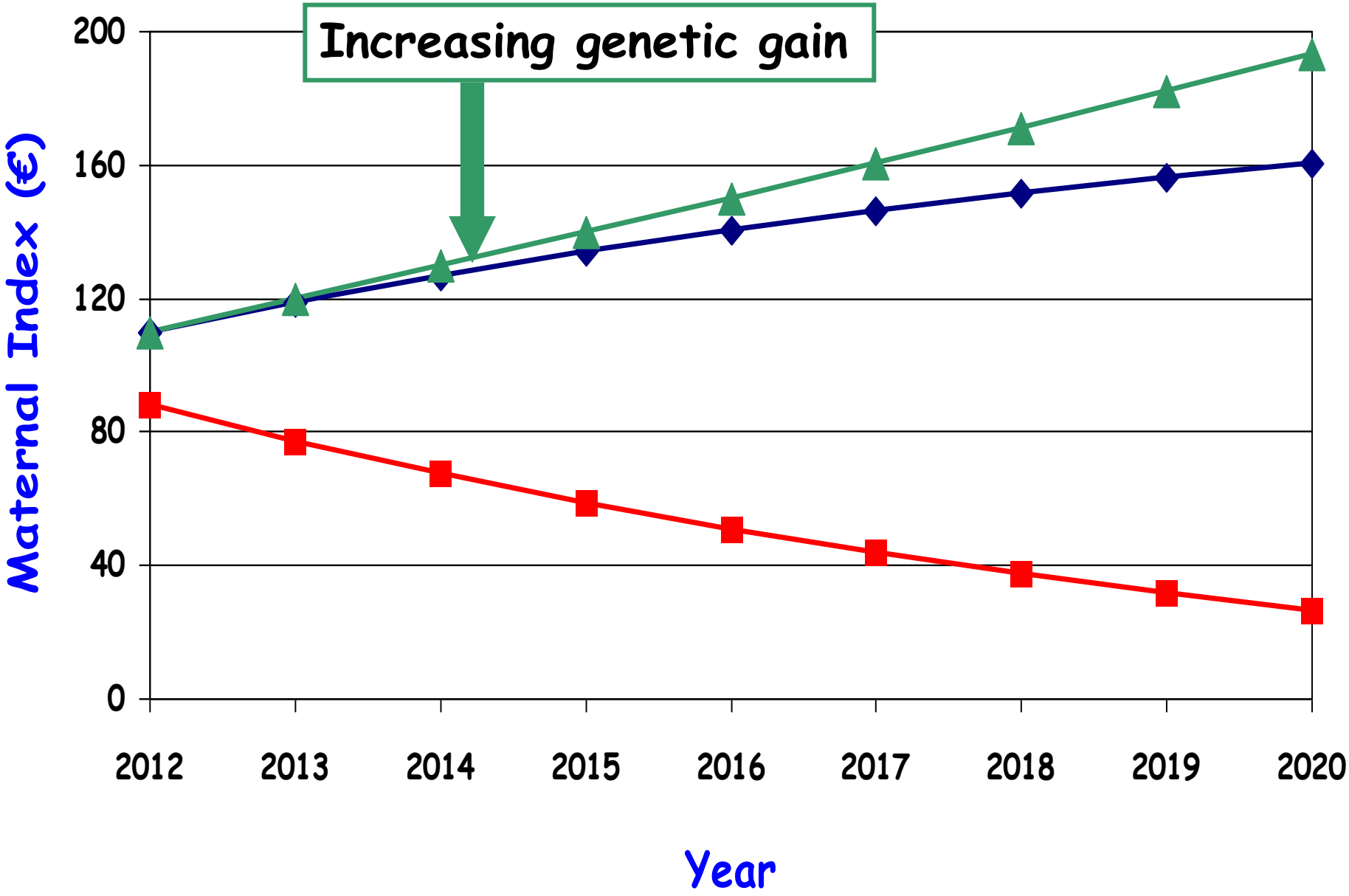
14 kg heavier at weaning

32 kg heavier at weaning

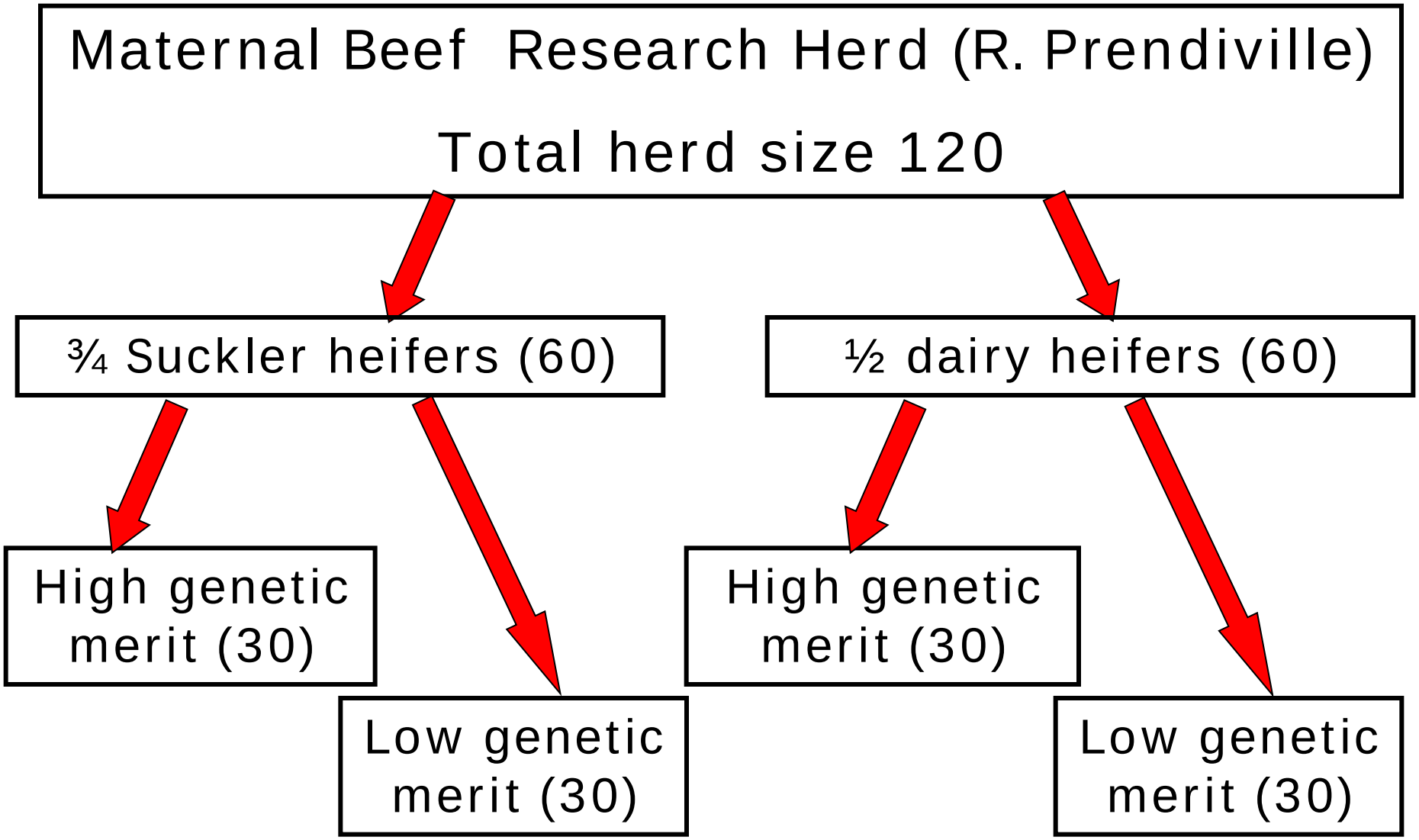
Selection on the overall index?



Selection on the overall index?



Future research


Maternal Beef Research Herd (R. Prendiville)
Total herd size 120
¾ Suckler heifers (60)
½ dairy heifers (60)
High genetic merit (30)
Low genetic merit (30)
High genetic merit (30)
Low genetic merit (30)

Overall Summary

- Genetic evaluations key to sustainable genetic gain
- New indexes →easier identification of bulls/cows for purposes
- Cost of production traits more important
- Ample genetic variation → maternal traits
- New maternal suckler beef cow research herd further investigate maternal traits