



IRISH CATTLE BREEDING FEDERATION

Jan'20 Evaluation Developments



Department of
**Agriculture,
Food and the Marine**

An Roinn
**Talmhaíochta,
Bia agus Mara**

Overview

1. Calving Evaluation

EBI

- From 1 trait to 4 traits

2. Genomics

EBI

- Inclusion of females and crossbred animals

3. Maintenance SI

EBI

- PTA change from cull cow weight to live weight

4. Dairy Beef Index

DBI

- Roll out to stock bulls and young pedigree breeding bulls

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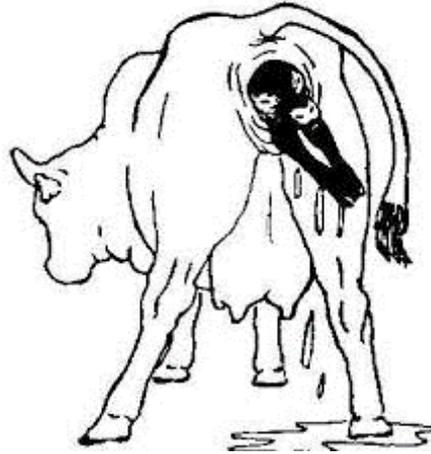
DBI

- Roll out to stock bulls and young pedigree breeding bulls
- Screens for first time

Background to Current Calving Evaluation

- **Predicted Transmitting Ability (PTA):** measure of genetic merit
PTA range: 1 - 30%
- **Reliability:** measure of confidence surrounding PTA
- Reliability: 0 - 99%

~20 million records on 40 breeds



No assistance

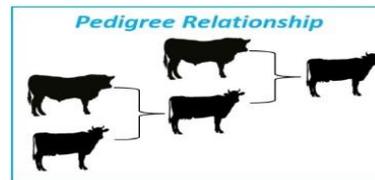
Some assistance

Vet assistance

Considerable assistance



Heritability
9%



Strenghts/Weaknesses

Strengths

- **One published trait and reliability for all systems**
- **Comparable across breeds**

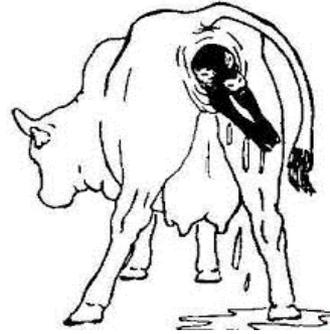


Weaknesses

- **No differentiation between contribution of heifer v cow records**
- **No differentiation between contribution of beef v dairy records**
- **High reliability bulls may NOT be proven on the type of cow you have**
 - **i.e. first crop progeny normally proven on mature cows**
- **Assumed that the genetic component is the same across all cow types**

New Calving Evaluation

Dairy Herd



Suckler Herd



Dairy Heifer

Dairy Cow



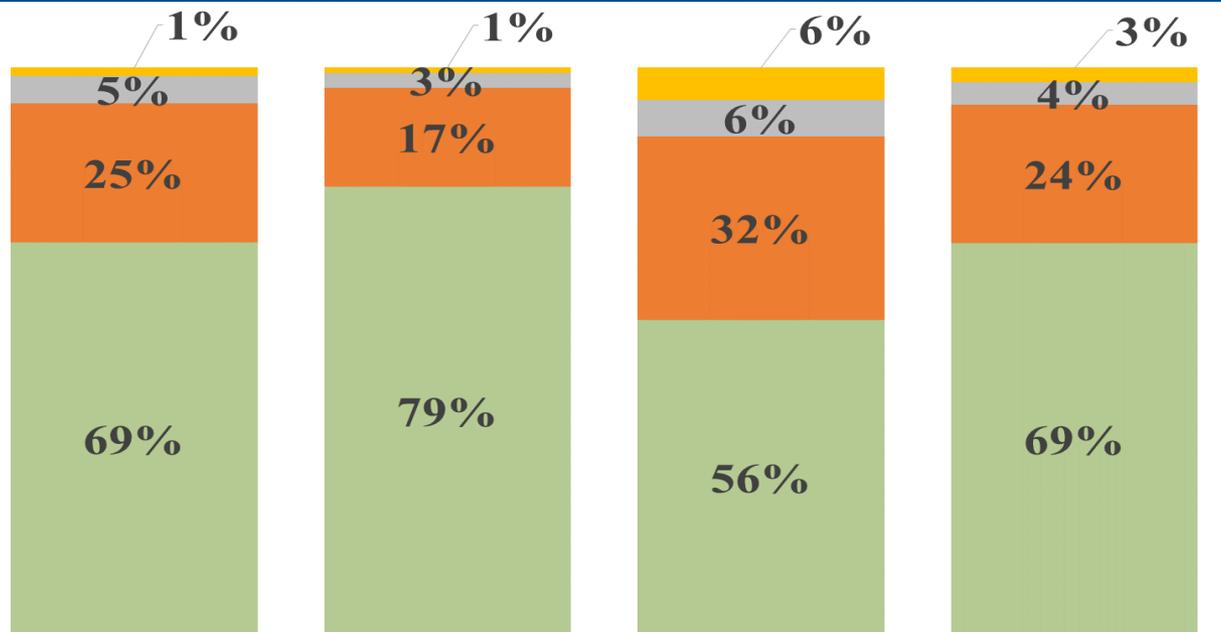
Beef Heifer

Beef Cow

Now treating as 4 distinct traits

New Trait phenotypic profiles

Distribution of Calving Difficulty Scores



Dairy Heifer
(956,190)

Dairy Cow
(3,071,396)

Beef Heifer
(270,063)

Beef Cow
(1,066,897)

■ Normal calving

■ Some Assistance

■ Considerable difficulty

■ Caesarean section

- Heifers have a higher incidence than cows
- Beef animals have a higher incidence than dairy animals

Heritability and Genetic correlations

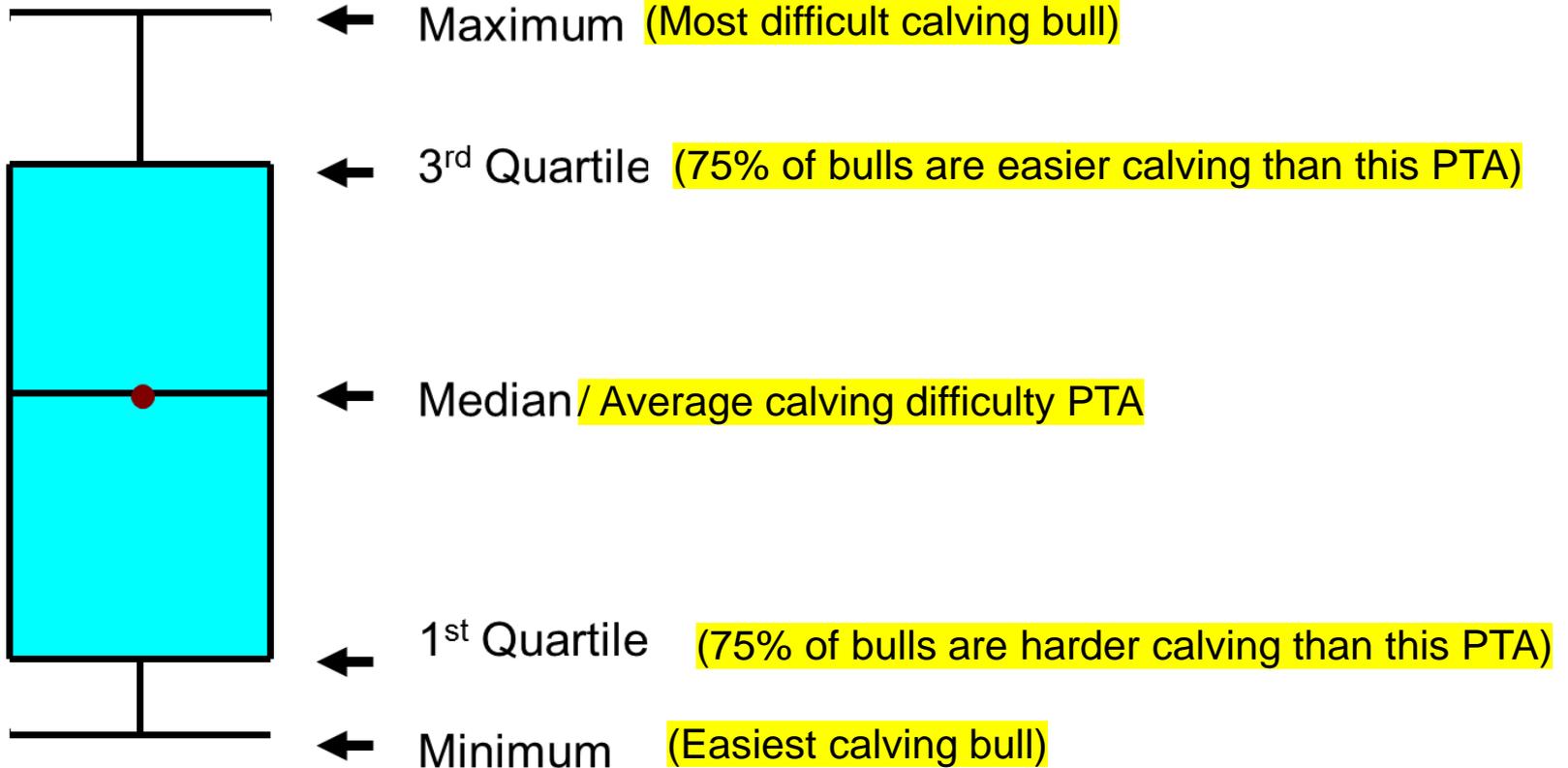
Trait	<i>heritability</i>	Dairy Heifer	Dairy Cow	Beef Heifer	Beef cow	Birth size
Dairy Heifer	16%					
Dairy Cow	8%	0.91				
Beef Heifer	17%	0.8	0.78			
Beef cow	15%	0.62	0.59	0.94		
Birth size	24%	0.82	0.74	0.88	0.85	
Birth weight	41%	0.63	0.64	0.64	0.62	0.52

International evaluation (INTERBULL)

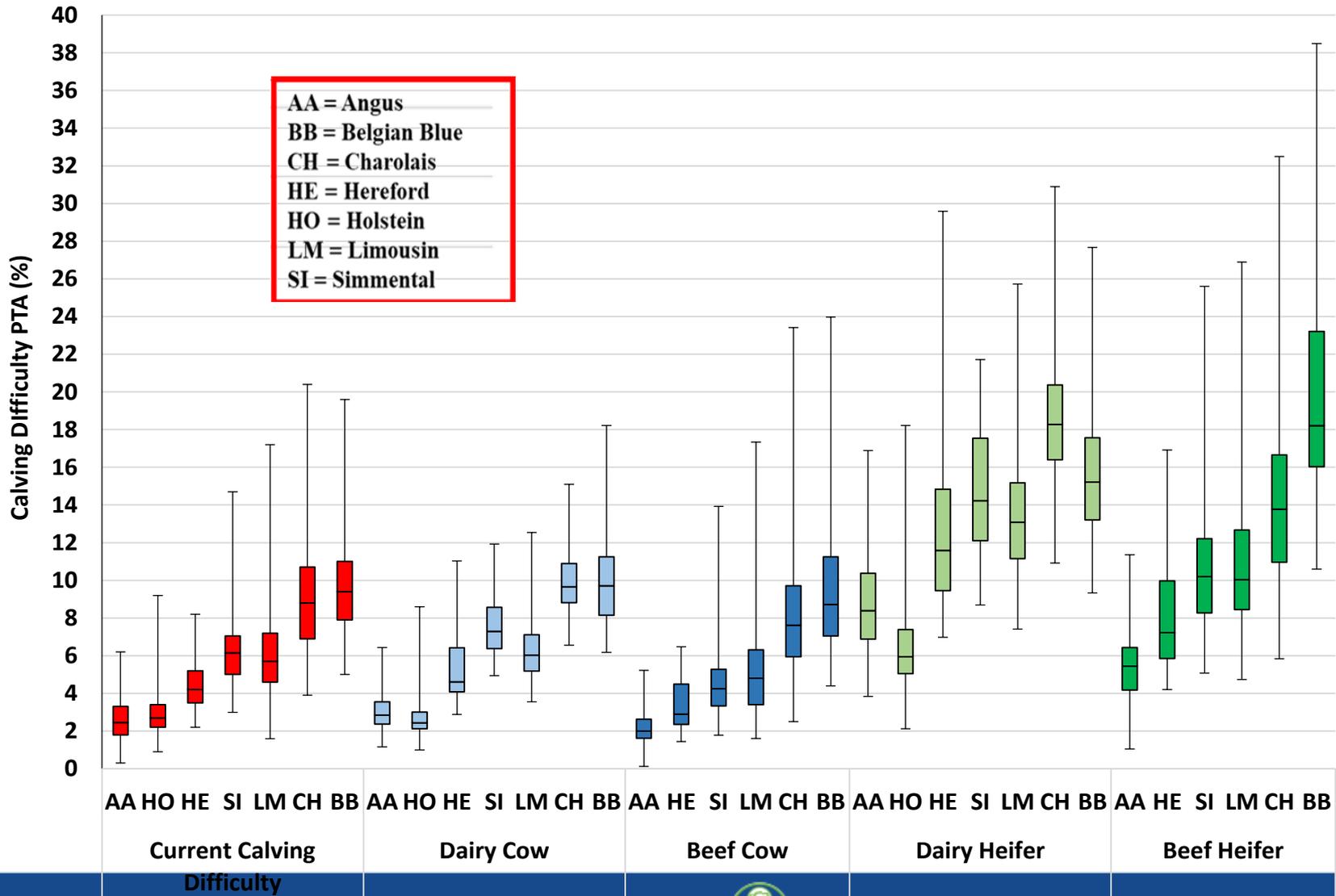
Country	Old	New	Difference
AUS	0.69	0.76	0.07
CAN	0.86	0.92	0.06
CHE	0.82	0.93	0.11
DFS	0.83	0.89	0.06
FRA	0.83	0.93	0.10
ISR	0.90	0.91	0.01
ITA	0.73	0.77	0.04
NLD	0.85	0.94	0.09
USA	0.77	0.84	0.07
GBR	0.74	0.77	0.03
HUN	0.74	0.77	0.03
DEU	0.77	0.86	0.09
BEL	0.74	0.77	0.03
NZL	0.82	0.75	-0.07
SVK	0.79	0.78	-0.01
ESP	0.77	0.77	0.00
Average	0.79	0.84	0.04

- Dairy Cow trait submitted from IRL to test run
- Improved correlation for 13 out of 16 countries

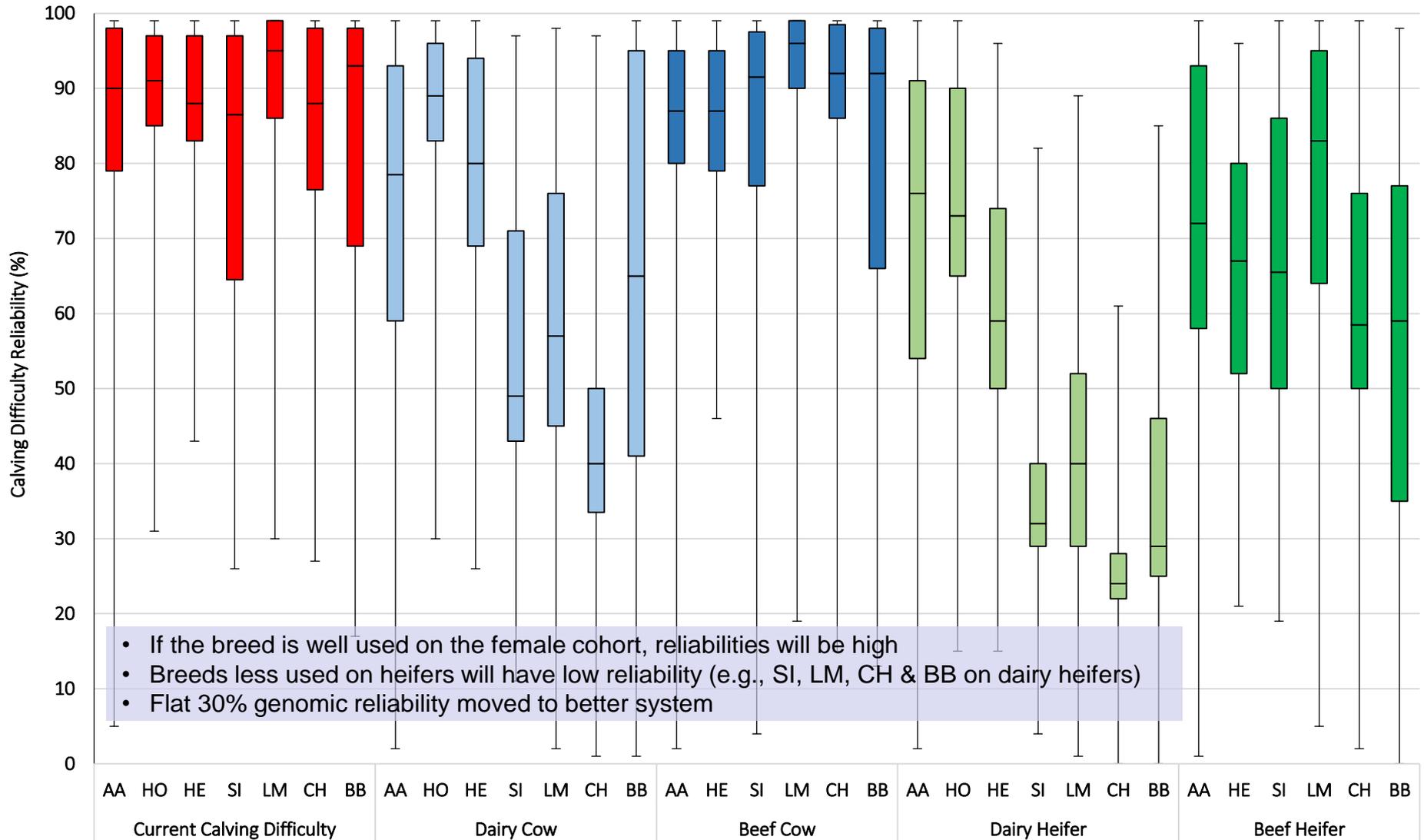
Understanding Box & Whiskers Plots



Breed profiles new v old



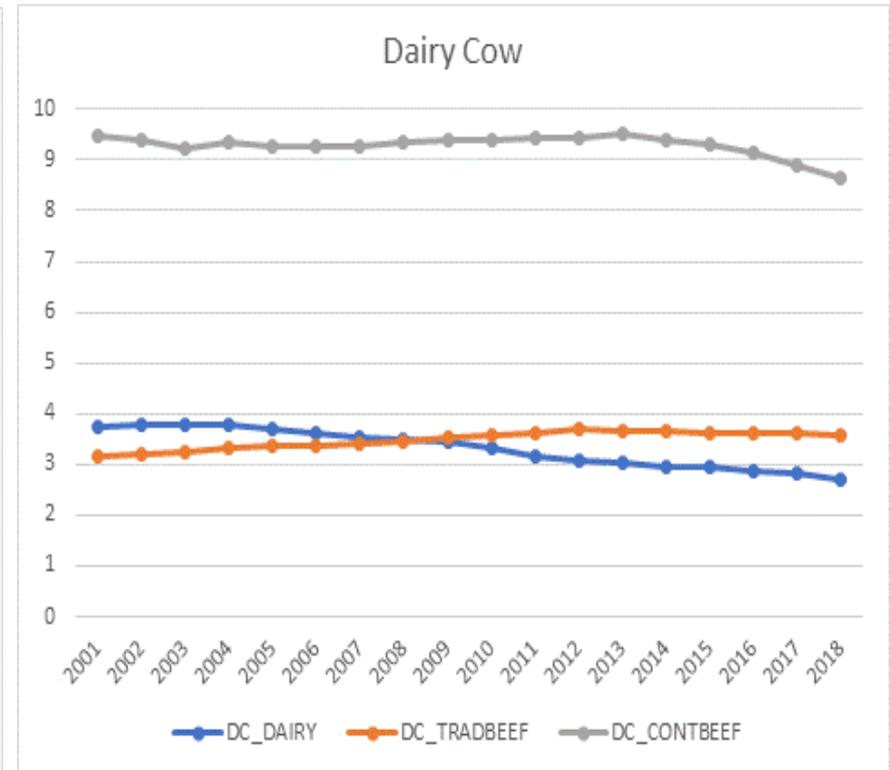
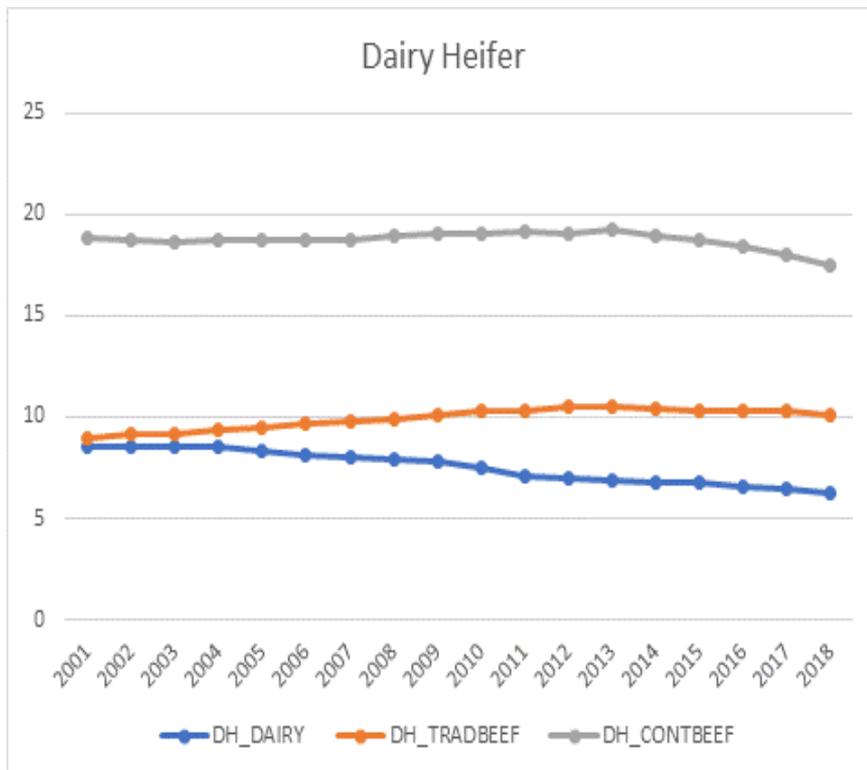
Reliability



- If the breed is well used on the female cohort, reliabilities will be high
- Breeds less used on heifers will have low reliability (e.g., SI, LM, CH & BB on dairy heifers)
- Flat 30% genomic reliability moved to better system

Based on Alive AI bulls Jan'20 evaluation

Genetic trends: Dairy herd traits

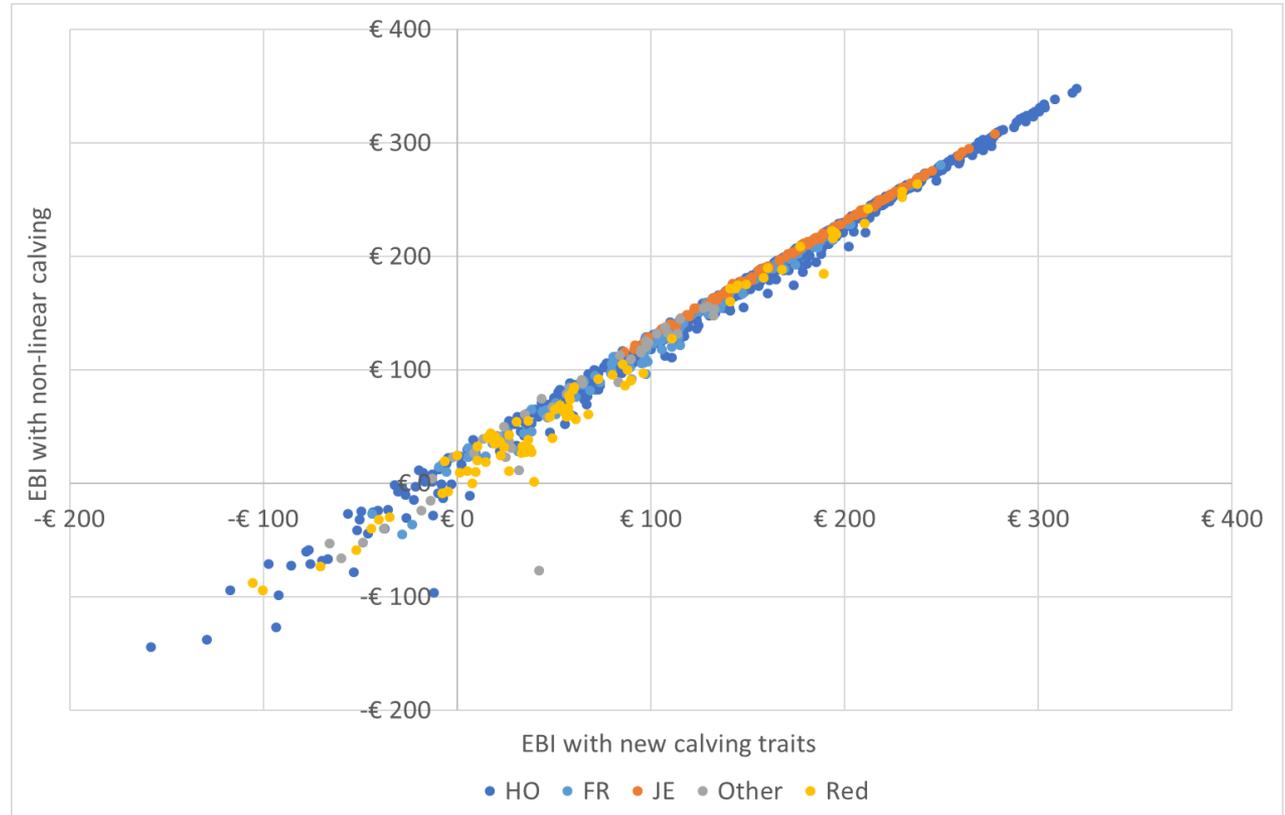


- More selection pressure on calving difficulty in dairy sires: impact of EBI
- Beef breeds stagnant but some progress in recent years in response to the market

Impact on EBI: Active AI Sires

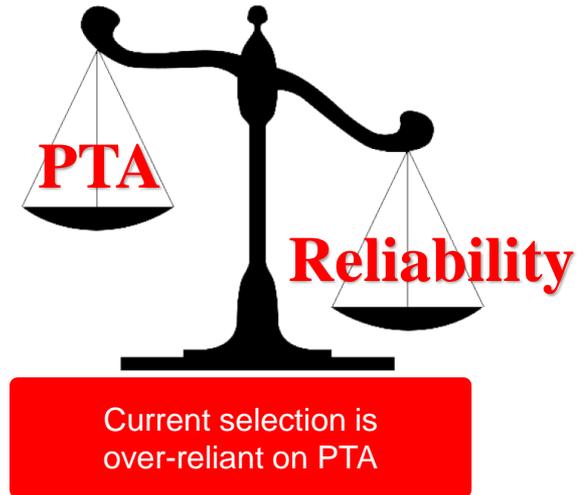
Add new calving traits

- 23% Dairy Heifer + 77% Dairy Cow aggregation for both direct and maternal
- Correlation of 0.995



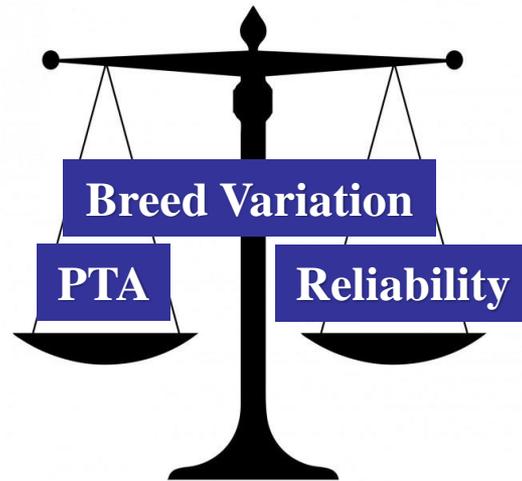
Selecting Bulls for Dairy Heifers: Cliff-Edge Approach

- What does a calving difficulty PTA of 2.0% mean?
- What's the difference between a calving difficulty PTA 2.3%, 2.6%, and 3.2%?



- In reality, a bull at 3.2% might be a much safer option for dairy heifers than a bull at 1.8%; this is breed and reliability dependent

Risk of Dairy Heifer Calving Difficulty



New methodology proposes to balance PTA, reliability and breed variation

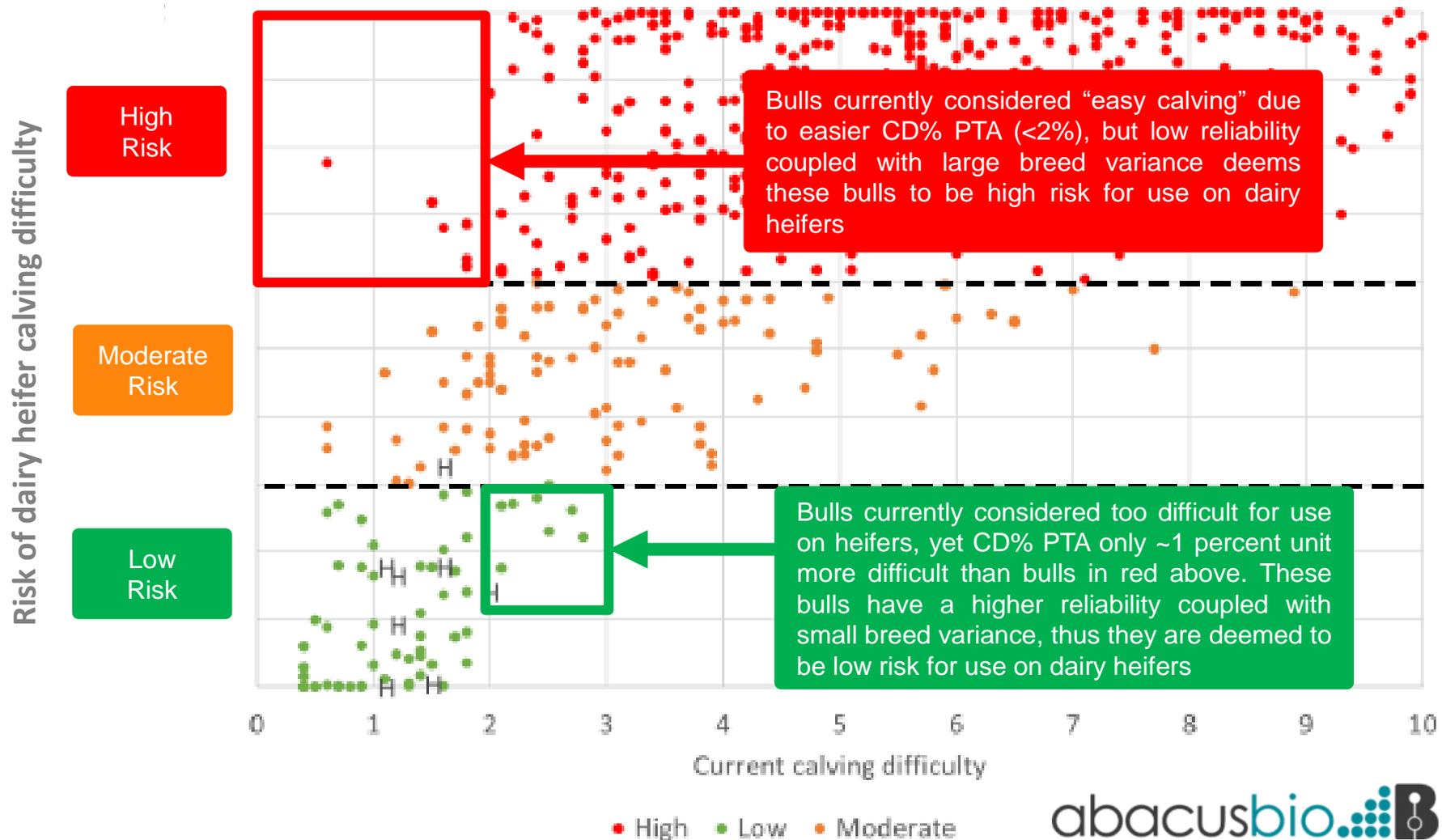
Probability a bull's true % of dairy heifer difficult calving is greater than **x%**

Risk levels:

1. **High Risk** (High* Risk; for bulls that are not genotyped)
2. **Moderate Risk**
3. **Low Risk**

abacusbio 

Benefit of Old Versus New Method



Fiona Hely, AbacusBio

Customised Interface for End-Users

- Email survey on 657 farmers (dairy & beef) revealed preference was to present all the calving difficulty PTAs but provide customised interfaces

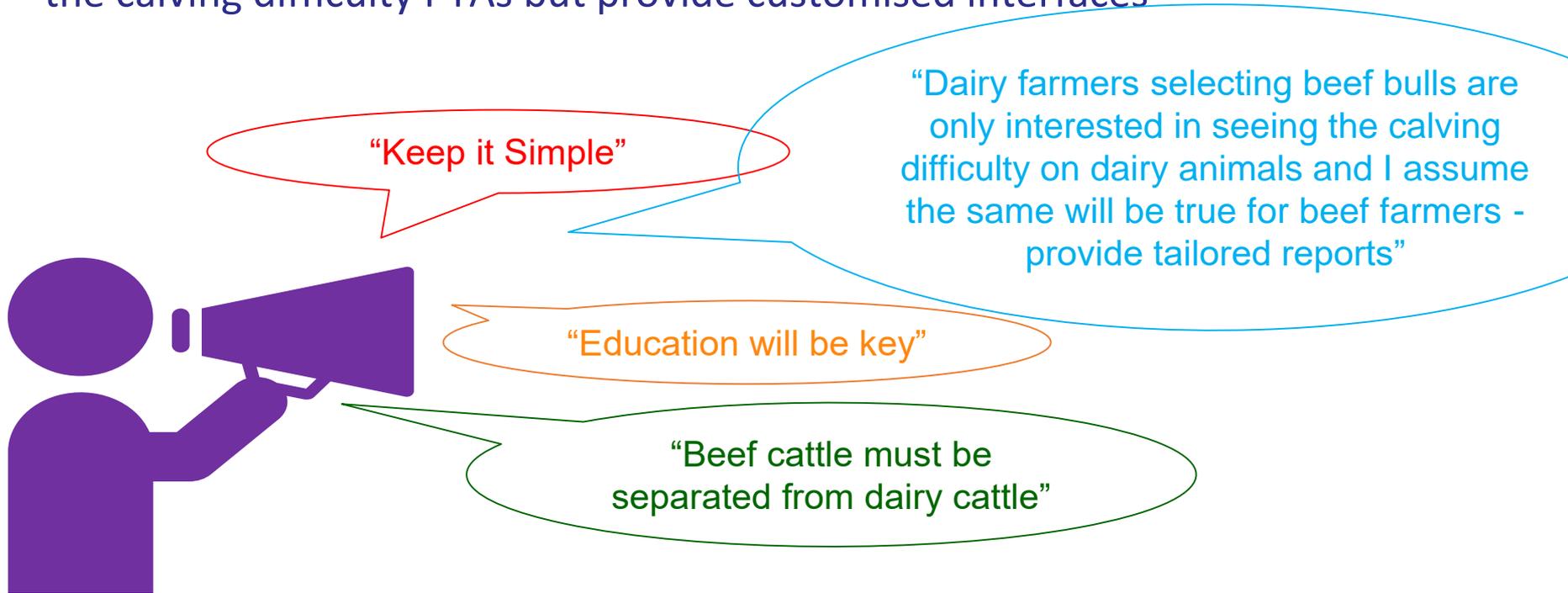


Table 1. Calving difficulty traits that will be presented for dairy and beef bulls which will be determined by the target audience

Bull Type	Audience	Calving Difficulty Traits Presented
Dairy Bull	Dairy Farmer	<ul style="list-style-type: none"> CD% on dairy heifers (PTA & reliability) CD% on dairy cows (PTA & reliability) Risk of dairy heifer calving difficulty (category: low/moderate/high)
Beef Bull	Beef Farmer	<ul style="list-style-type: none"> CD% on beef heifers (PTA & reliability) CD% on beef cows (PTA & reliability)
Beef Bull	Dairy Farmer	<ul style="list-style-type: none"> CD% on dairy heifers (PTA & reliability) CD% on dairy cows (PTA & reliability) Risk of dairy heifer calving difficulty (category: low/moderate/high)

Example: Animal Search for Beef Bull



Beef Farmer

Dairy Farmer

Genotype included in evaluation

Replacement/Terminal Replacement Dairy Beef

Euro-star Index | Replacement Graphics | Terminal Graphics | Linear Type | TB And Liver Fluke | Pedigree | Evaluation History | Index Comparison

Star Rating (within Limousin breed)	Economic Indexes	Purpose	Euro value	Index reliability	Star Rating (across all beef breeds)
★★★★★	Replacement (per daughter lactation)	To breed future cows for the suckler herd	€131	99% (V High)	★★★★★
★★★☆☆	Terminal	To breed beef animals from the suckler herd that are destined for slaughter	€121	97% (V High)	★★★★☆

Calving Difficulty (Births requiring considerable assistance)

When Mated With:	Value	Reliability
Beef Heifers Breed avg: 4.69%, All breeds avg: 4.49%	8.36%	99% ()
Beef Cows Breed avg: 4.66%, All breeds avg: 4.49%	3.30%	99% ()

Star Rating (within Limousin breed)	Key profit traits	Index value	Trait reliability	Star Rating (across all beef breeds)
Expected progeny performance				
★★★★☆	Docility (1-5 scale) Breed avg: -0.06, All breeds avg: 0.01	-0.03 scale	99% (V High)	★★★☆☆
★★★★☆	Carcass weight (kg) Breed avg: 23.68kg, All breeds avg: 16.19kg	19.5kg	99% (V High)	★★★★☆
★★★★☆	Carcass conformation (1-15 scale) Breed avg: 2.14, All breeds avg: 1.38	2.18 scale	99% (V High)	★★★★★
Expected daughter breeding performance				
★★★★☆	Daughter calving difficulty (% 3 & 4) Breed avg: 5.05%, All breeds avg: 5.79%	12.14%	94% (V High)	★★★★☆
★★★★☆	Daughter milk (kg) Breed avg: -0.72kg, All breeds avg: 2.24kg	-3.00kg	98% (V High)	★★★☆☆
★★★★★	Daughter calving interval (days) Breed avg: 1.21 days, All breeds avg: -0.78 days	-5.93days	84% (V High)	★★★★★

Genotype included in evaluation

Replacement/Terminal Replacement Dairy Beef

Dairy Beef Graphics | Euro-star Index | Replacement Graphics | Terminal Graphics | Linear Type | TB And Liver Fluke | Pedigree | Evaluation History | Index Comparison

Dairy Beef Index
Use the Dairy Beef Index to breed beef animals from the dairy herd that are destined for slaughter

Index: Euro Rel

Index	Euro	Rel
Dairy Beef Index	90	97%
Value of Calving Sub-Index	-34	98%
Value of Beef Sub-Index	124	96%

Value of Calving Sub-Index

Value of Calving Sub-Index	FTA	Rel
Risk of Calving Difficulty on Dairy Heifers: Low	12.41	85%
Dairy Heifer Calving Difficulty (%)		98%
Dairy Cow Calving Difficulty (%)	5.19	98%
Gestation Length (days)	3.9	99%
Calf Mortality (%)	-0.17	99%

Value of Beef Sub-Index	FTA	Rel
Feed Intake (kg)	-0.74	84%
Docility (scale)	-0.03	99%
Carcass Weight (kg)	19.50	99%
Carcass Fat (scale)	0.08	99%
Carcass Conformation (scale)	2.18	99%
Out of Spec: Weight (%)	2.18	99%
Out of Spec: Conformation (%)	2.18	99%
Polledness	1	1



ICBF Dairy Active Bull List

Help

Bulls with an EBI reliability% > 35% and Calving Difficulty reliability% > 70% with > 50 calving records are included
 (Bulls of breeds other than genomically tested Ho/FR have to have a daughter proven production proof (along with relevant calving criteria) to make the active bull list.)
 Risk of Dairy Heifer CDiff: High* is the default risk category where bulls are not genotyped

Evaluation Date: Nov 2019

Show 25 rows. Showing 1 to 25 of 351 entries

First Previous 1 2 3 4 Next Last Hide filters Excel PDF Print

From To Code Bull Name Sire Main Bre Herd Book Status HO % GI Proof Source Milk Fert Calv Beef Maint Mgt Health Risk of Dairy Heifer CDiff Dairy Heifer CD% Dairy Cow CD% Dairy Calv Recs Avail Price Supplier

Bull Details								EBI Details			EBI Sub-Indexes							Calving Difficulty Details				Semen Details		
Rk	Code	Bull Name	Sire	Main Breed	Herd Book Status	HO %	GI	EBI €	Rel %	Proof Source	Milk	Fert	Calv	Beef	Maint	Mgt	Health	Risk of Dairy Heifer CDiff	Dairy Heifer CD%	Dairy Cow CD%	Dairy Calv Recs	Avail	Price	Supplier
1	FR4513	(IG) BALLYGOWN ALBERT	FR2249	HO	PED	72	Yes	342	62	GS	148	125	62	-10	2	11	4	Moderate	6.3	2.7	857	Medium	22	
2	FR4554	CURRA FIONN	FR2239	HO	SRM	75	Yes	329	63	GS	66	178	67	-11	20	2	6	Moderate	4.4	1.8	290	High	21	
3	FR2424	POSSEXTOWN FAITHFUL	ABO	HO	SRM	66	Yes	313	77	DP-IRL	105	158	43	-17	15	5	4	Moderate	4.7	2	2027	High	21	
4	FR2249	COOLNASOON ART	AGH	HO	PED	75	No	313	82	DP-IRL	143	125	56	-16	3	13	-12	Moderate	6.5	2.6	13810	High	18	Dovea
5	FR4021	(IG) BALLINTESKIN ARNOLD	GZY	HO	PED	59	Yes	298	73	DP-IRL	49	204	39	-16	13	1	8	Low	5.4	2.4	8049	High	19	
6	FR4339	(IG) LEACHTNEILL DARBY	SEW	HO	PED	84	Yes	297	65	GS	66	150	61	-18	12	8	18	Low	4.6	2	394	High	22	
7	FR4478	(IG) SPRINGHAVEN NUA	PHC	HO	PED	88	Yes	293	66	GS	41	193	36	8	3	5	7	High	4.8	2	233	High	20	
8	FR4510	(IG) RONNOCO MILAN	GZY	HO	PED	81	Yes	288	65	GS	99	139	40	-9	2	3	14	Low	6.2	2.8	320	High	22	
9	FR4337	(IG) GABRIEL ZORO	FR2298	HO	SRM	75	Yes	287	62	GS	89	130	52	-12	10	6	12	Low	5.6	2.4	533	High	22	
10	FR4338	(IG) CRAIGTOWN TORNADO	FR2385	HO	SRM	59	Yes	281	62	GS	70	129	63	-11	18	5	7	Low	4.4	1.9	738	High	23	
11	FR2426	CLONDROHID BLACK LIGHTNING	YRY	HO	PED	94	Yes	278	81	DP-IRL	54	172	49	-19	13	0	8	Moderate	4.4	2	4070	High	21	

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Lot 1 RYLE GLEN EDWARD

ID: 372224752030955

Breed: Hereford

[Modified suckler page](#)

Sex: Male

DOB: 11-Nov-2017

Owner: Joe Bloggs - Timbucktwo, Co. Clare

Breeder: John Murphy - Causeway, Co. Kerry

Sire: Portanob Peter

Ardmulchan

Westwood Uplifter

IE281398910327

Goodman

Ardmulchan Clover 39th

Sire Verified (SNP)

Portanob Julia 2

Ardmulchan Wanderor

Dam: Ryle Glen Sheila V

Maclone Ger (X)

Maclone Bruno

IE331186220499

Ryle Glen Sheila 2nd (X)

Hazelfield Sharon (X)

Dam Verified (SNP)

Breaney Sam

Ryle Glen Sheila (X)



Evaluation Date: Sep 2019; Next Evaluation Date: 21 Nov 2019

Star Rating (Within Hereford breed)	Economic Indexes	Euro value per progeny	Index Reliability	Star rating (across all beef breeds)
★	Replacement	€28	40% (Average)	★
★★★★	Terminal	€48	44% (Average)	★

Calving Difficulty (Births requiring considerable assistance)		
When Mated With:	Value	Reliability
Beef cows Breed avg: 2.9%, All breeds avg: 4.0%	2.1%	70% (High)
Beef heifers Breed avg: 6.8%, All breeds avg: 8.4%	4.1%	64% (High)

Star Rating (within Hereford breed)	Key Replacement Profit Traits	Value	Reliability	Star Rating (across all beef breeds)
Expected Progeny Performance				
★★	Docity (1-5 scale) Breed avg: 0.1, All breeds avg: 0.01	0.07 scale	38% (Low)	★★★★★
★★★	Carcass weight (kg) Breed avg: 4.43kg, All breeds avg: 16.19kg	+4.7kg	46% (Average)	★
★★★★★	Carcass conformation (1-15 scale) Breed avg: 0.49, All breeds avg: 1.38	+0.77 scale	45% (Average)	★

Expected Daughter Breeding Performance				
	Daughter calving diff (% 3 & 4) Breed avg: 5.96%, All breeds avg: 5.79%	+6.01%	39% (Low)	
★★	Daughter milk (kg) Breed avg: 3.28kg, All breeds avg: 2.24kg	+2.2 kg	37% (Low)	★★★★
★	Daughter calving interval (days) Breed avg: -3.27days, All breeds avg: -0.77days	-0.76 days	37% (Low)	★★★★

Additional Information:		Linear composites Value Reliability	
Myostatin: F94L Non Carrier, NT821 Non Carrier		Muscle	
		Skeletal	
		Function	
		Herd data quality index	
Animal not scored.		N/A	

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Dairy-Beef Index and Key Profit Traits

Evaluation Date: Sep 2019; Next Evaluation Date: 21 Nov 2019

	Dairy Beef Index	Calving Value SI	Beef Value SI	Gestation	Dairy Heifer CDiff	Dairy Cow CDiff	Carcass Weight	Carcass Conf
All Breed Average	-€5.35	-€12.13	€6.78	+1.5 days	12.0%	4.7%	4.4 kg	+0.49
HE Breed Average	-€14.52	-€74.96	€60.44	+2.7 days	12.7%	5.8%	16.2 kg	+1.38
LM Breed Average	-€14.52	-€74.96	€60.44	+2.7 days	12.7%	5.8%	16.2 kg	+1.38
SI Breed Average	-€14.52	-€74.96	€60.44	+2.7 days	12.7%	5.8%	16.2 kg	+1.38

LOT 1

RYLE GLEN EDWARD

372224752030955

Breed Hereford

Birthdate 11-Nov-2017

Sire IE281398910327 (Portanob Peter); Sire Verified (SNP)

Dam IE331186220499 (Ryle Glen Sheila V); Dam Verified (SNP)

GENOTYPED

Dairy Beef Index	Dairy Beef Index	Calving Value SI	Beef Value SI	
€48 (Rel:40%)	€48 (Rel:40%)	-€29 (Rel:23%)	€35 (Rel:43%)	
Calving Traits	Gestation	Dairy Cow CDiff	Risk of Dairy Heifer CDiff	Dairy Heifer CDiff
	-2.4 days (Rel:38%)	2.5% (Rel:34%)	High Risk	12.1% (Rel:53%)
Beef Traits	Carcass Weight	Carcass Conformation	0.77 (Rel:45%)	
	4.7 kg (Rel:46%)			

Additional Information Myostatin: F94L Non Carrier, NT821 Non Carrier

LOT 2

CILL CORMAIC QUARTZ

372222028060634

Breed Limousin

Birthdate 27-Oct-2017

Sire GGM (Gageboro Morgan); Sire Verified (SNP)

Dam IE301326840486 (Cill Cormaic Nadine); Dam Verified (SNP)

GENOTYPED

Dairy Beef Index	Dairy Beef Index	Calving Value SI	Beef Value SI	
€31 (Rel:44%)	€31 (Rel:44%)	-€17 (Rel:33%)	€11 (Rel:44%)	
Calving Traits	Gestation	Dairy Cow CDiff	Risk of Dairy Heifer CDiff	Dairy Heifer CDiff
	+0.9 days (Rel:59%)	3.3% (Rel:71%)	Medium Risk	8.6% (Rel:67%)
Beef Traits	Carcass Weight	Carcass Conformation	0.49 (Rel:46%)	
	0.8 kg (Rel:46%)			

Additional Information

LOT 3

GURTERAGH DICTATOR 757 ET

372213625340757

Breed Simmental

Birthdate 21-Nov-2017

Sire IE151205870652 (Gurteragh Oakley 652)

Dam IE151205820367 (Gurteragh Fantasy)

Dairy Beef Index	Dairy Beef Index	Calving Value SI	Beef Value SI	
	Dairy Beef Index not available as animal is not genotyped			
Calving Traits	Gestation	Dairy Cow CDiff	Risk of Dairy Heifer CDiff	Dairy Heifer CDiff
	+2.2 days (Rel:39%)	5.1% (Rel:66%)	High Risk	11.4% (Rel:61%)
Beef Traits	Carcass Weight	Carcass Conformation	0.67 (Rel:45%)	
	5.3 kg (Rel:46%)			

Additional Information

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Summary

- Existing calving evaluation PTAs and reliability not a true reflection of on-farm performance; dependent on mate
- Existing calving evaluation to be terminated next week and replaced with a new split calving evaluation
 - Moving from 1 to 4 PTAs (and associated rels); dairy heifer, dairy cow, beef heifer & beef cow
- To address the cliff-edge approach of rigid thresholds for selecting bulls for use on dairy heifers (e.g., max CD PTA of 2.4%) a new trait will be available to delve into the “risk of dairy heifer calving difficulty”
 - A bull will be categorised as either low, moderate, high, or high* risk.
 - The category is determined by the PTA, reliability and within breed variance
 - Bulls not genotyped are defaulted to high* risk
- Tailored interfaces, specific to the end-user will help with the roll-out

Overview

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- From 1 trait to 4 traits

2. Genomics

EBI

- Inclusion of females and crossbred animals

3. Maintenance SI

EBI

- PTA change from cull cow weight to live weight

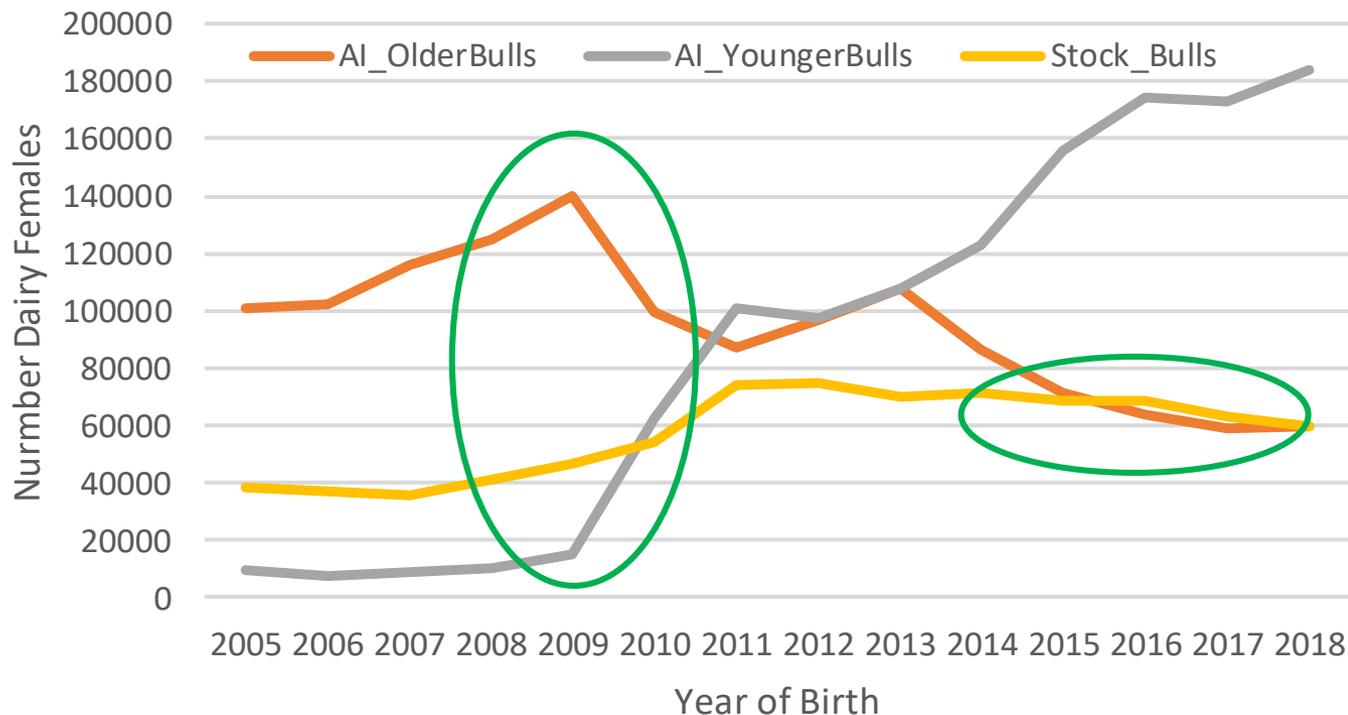
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- Roll out to stock bulls and young pedigree breeding bulls
- Screens for first time

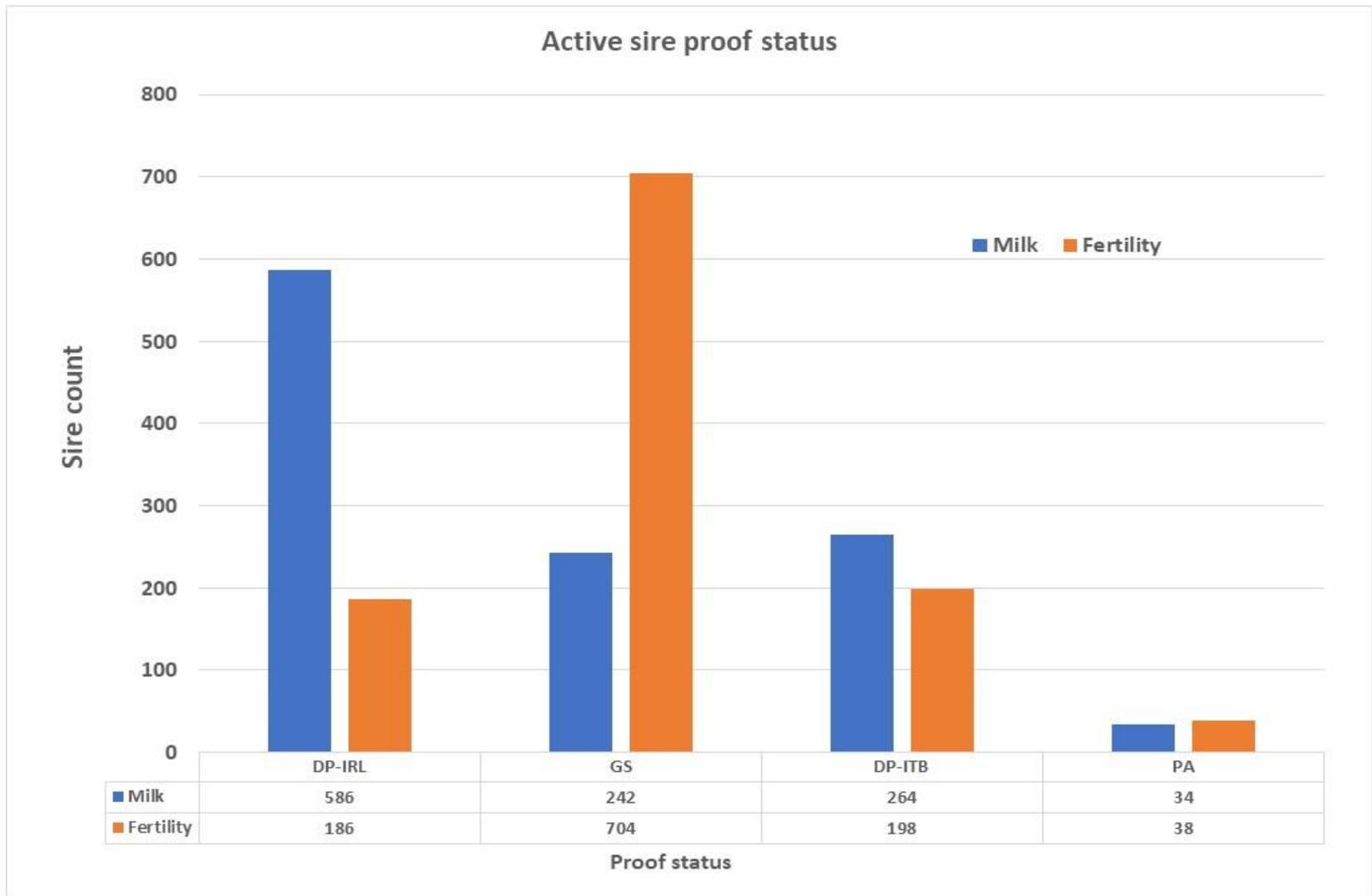
Impact of genomics on sire selection

Number of Dairy Females born, by Sire Type.

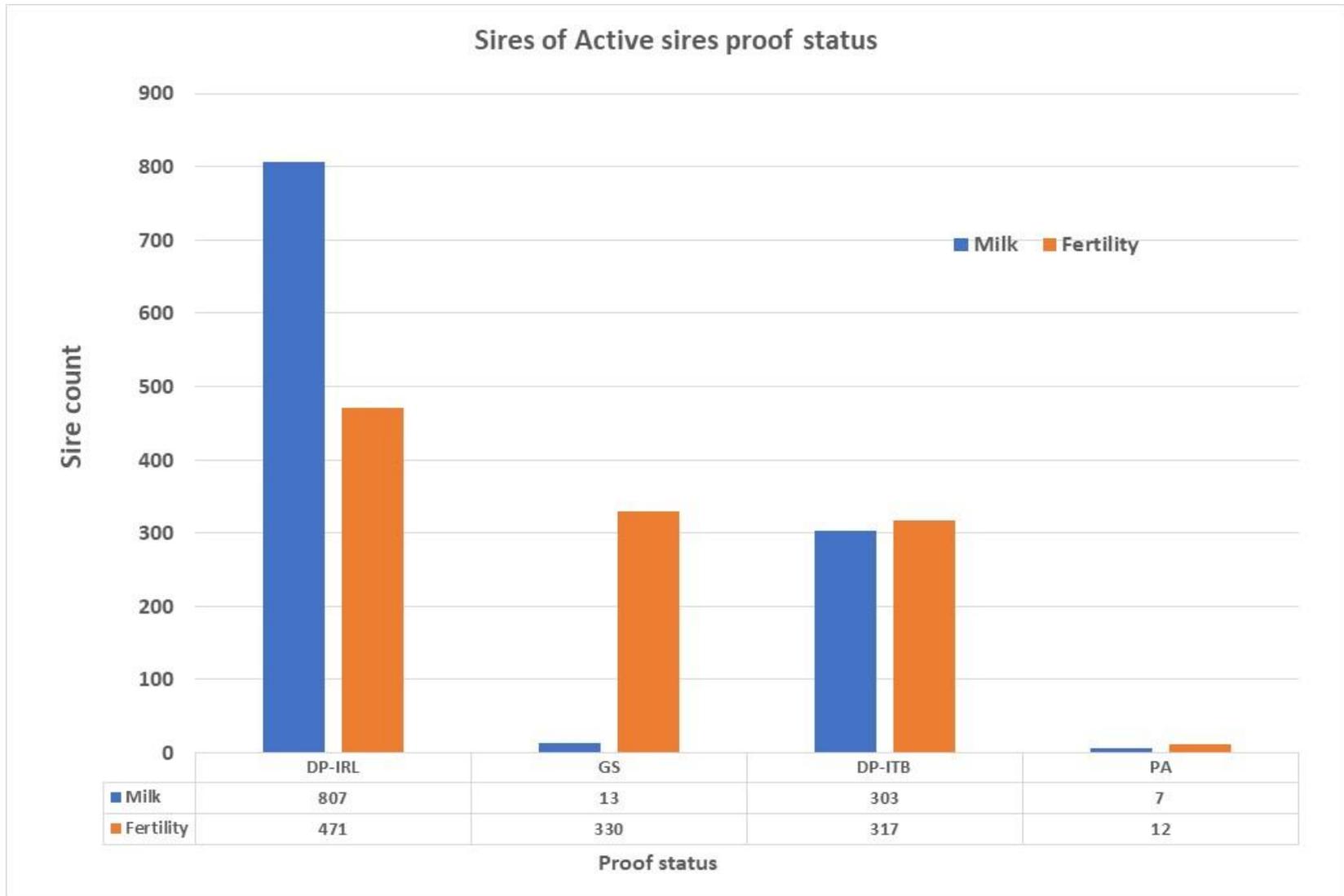


- Introduction of genomic selection technology (GS) in 2009 => immediate increase in use of younger (GS) bulls.
 - Increase in reliability of young bull proofs from 30% to 50%+ (equivalent to 30 progeny records).
- 75% of dairy AI in Ireland now to younger GS bulls.
- Older "well proven" bulls declining.
- Stock bulls also declining slightly.

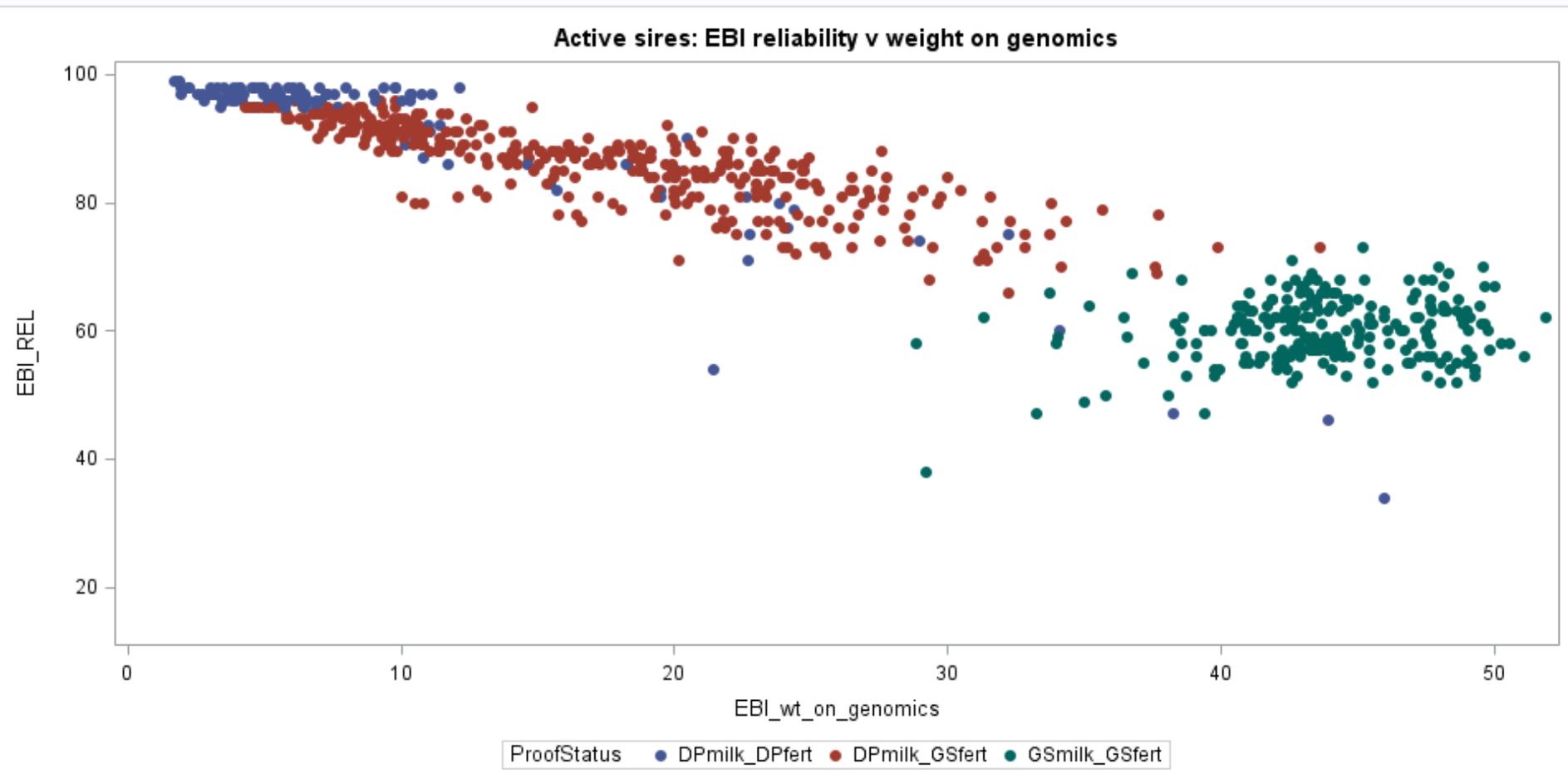
Current Proof status of Active sires



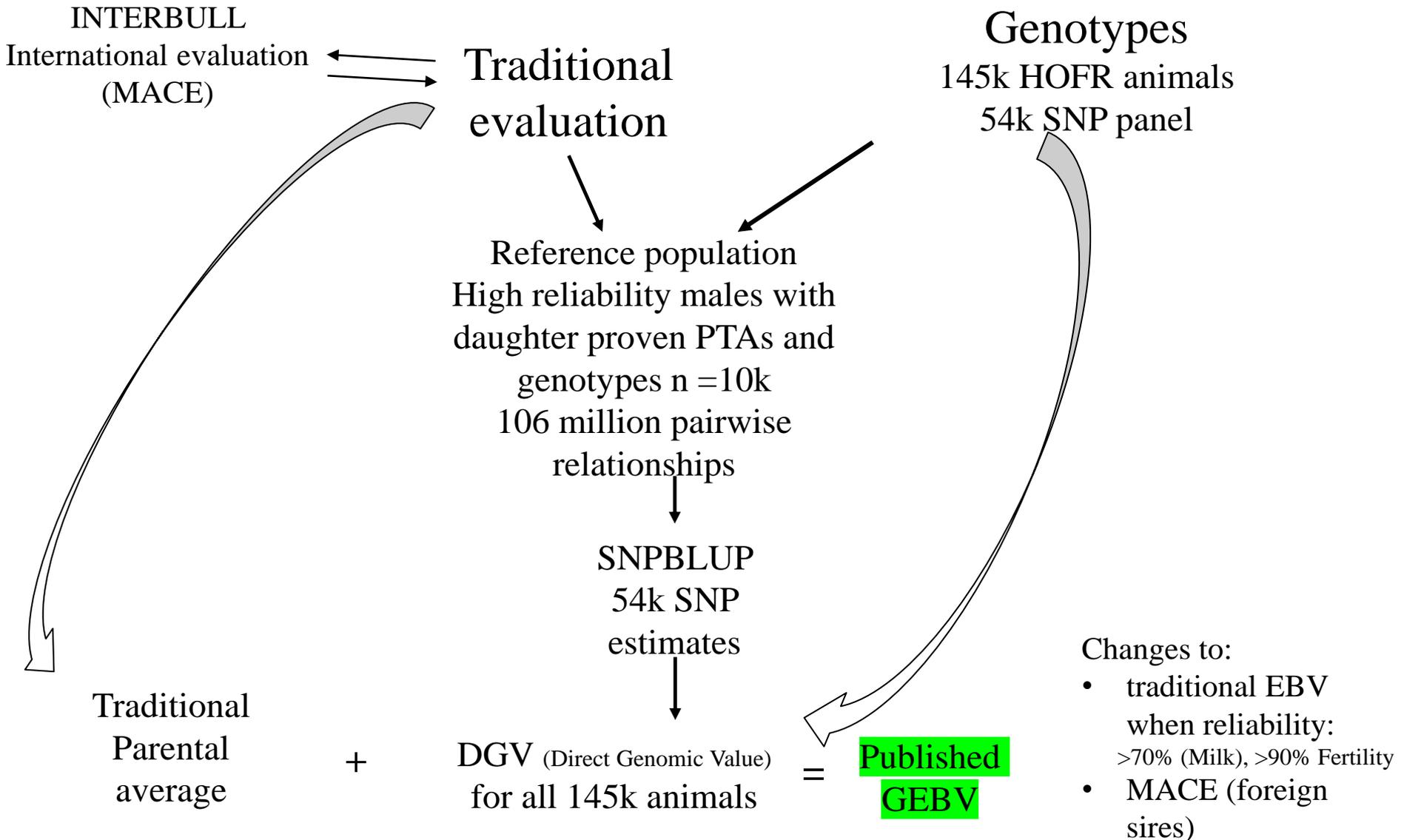
Current Proof status of Sires of Active sires



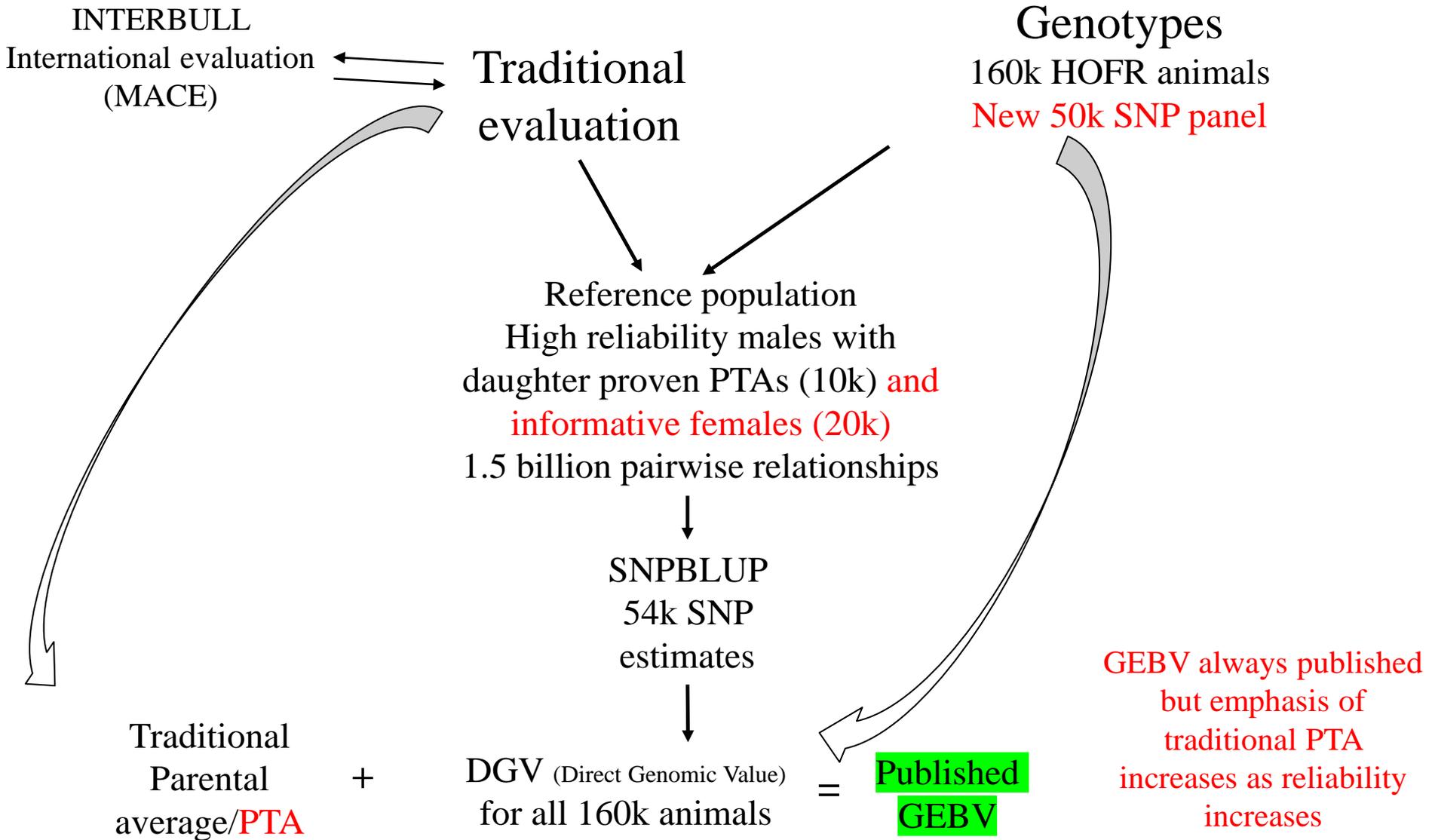
Influence of genomics on reliability



Current Dairy Genomics process



New Dairy Genomics process



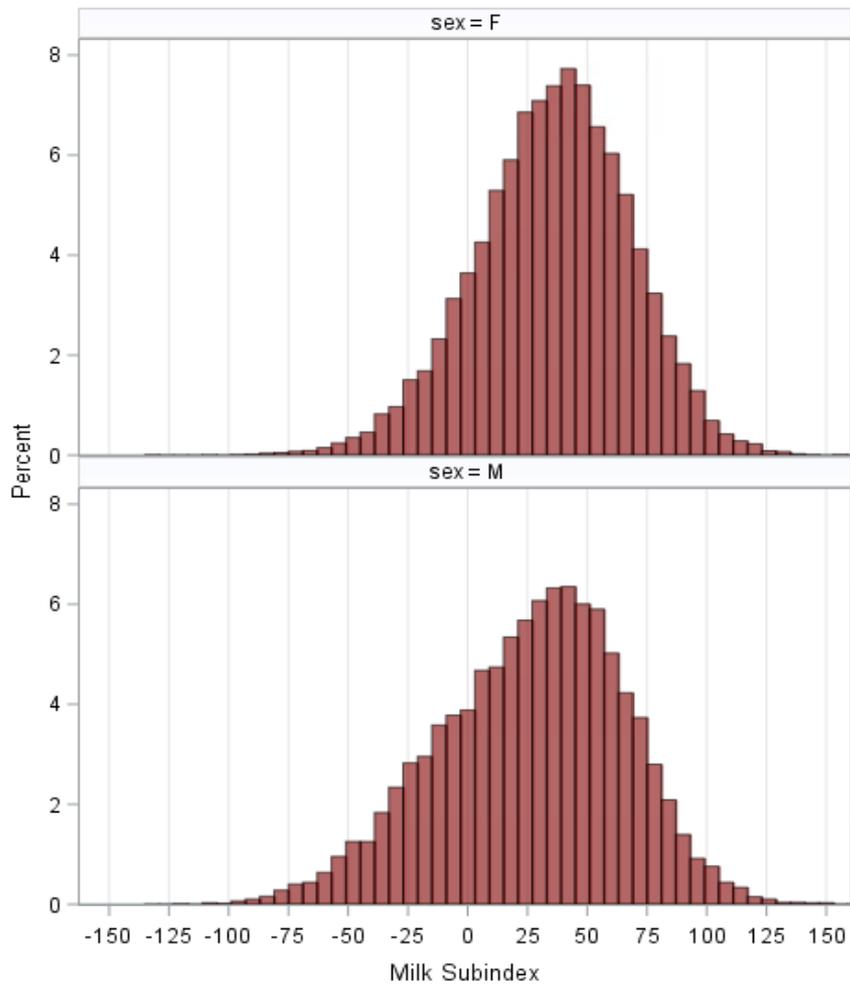
Training Population changes

Milk Traits	Animals in training			Breed		Training Reliability		
	Male	Female	Total	HO/FR	Other	Male	Female	All
Current	10,290	0	10,290	10,290	0	71%	-	71%
+ other breed males	10,628	0	10,628	10,327	301	71%	-	71%
+ other breed males + females	10,690	19,934	30,624	28,285	2,339	71%	78%	76%

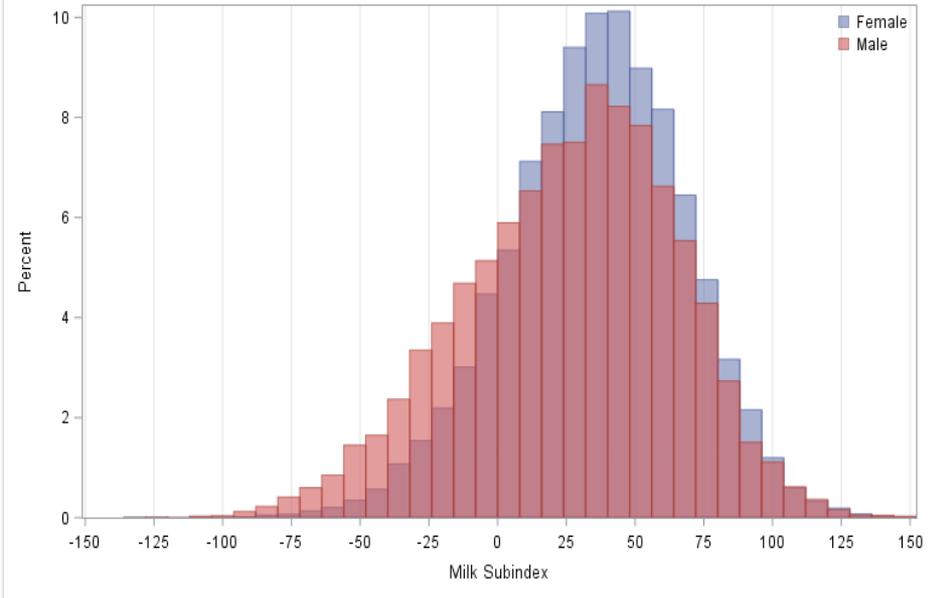
Calving interval	Animals in training			Breed		Training Reliability		
	Male	Female	Total	HO/FR	Other	Male	Female	All
Current	9,285	0	9,285	9,285	0	55%	-	55%
+ other breed males	9,622	0	9,622	9,323	299	55%	-	55%
+ other breed males + females	9,484	31,258	40,742	37,058	3,684	55%	36%	41%

Training Population Milk Traits

**Milk Subindex for training population
Multibreed males and females in training population**



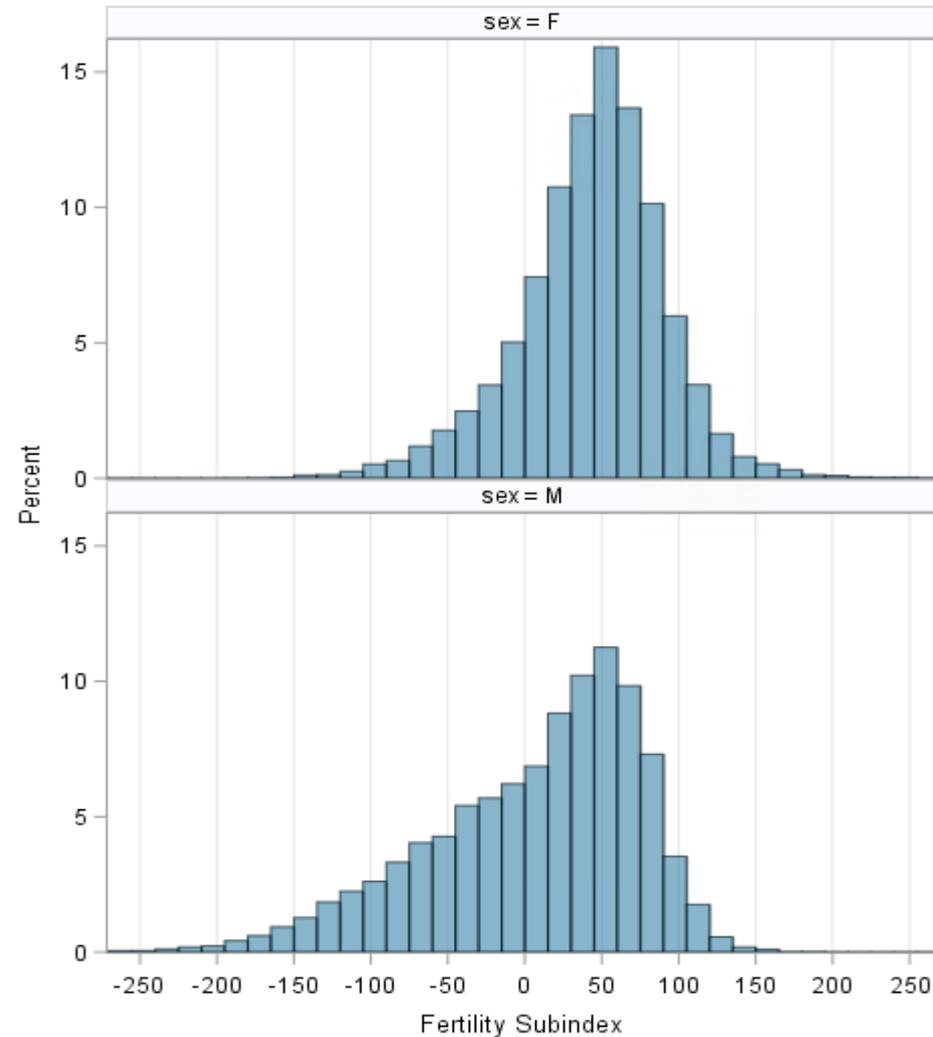
**Milk Subindex for training population
Multibreed males and females in training population**



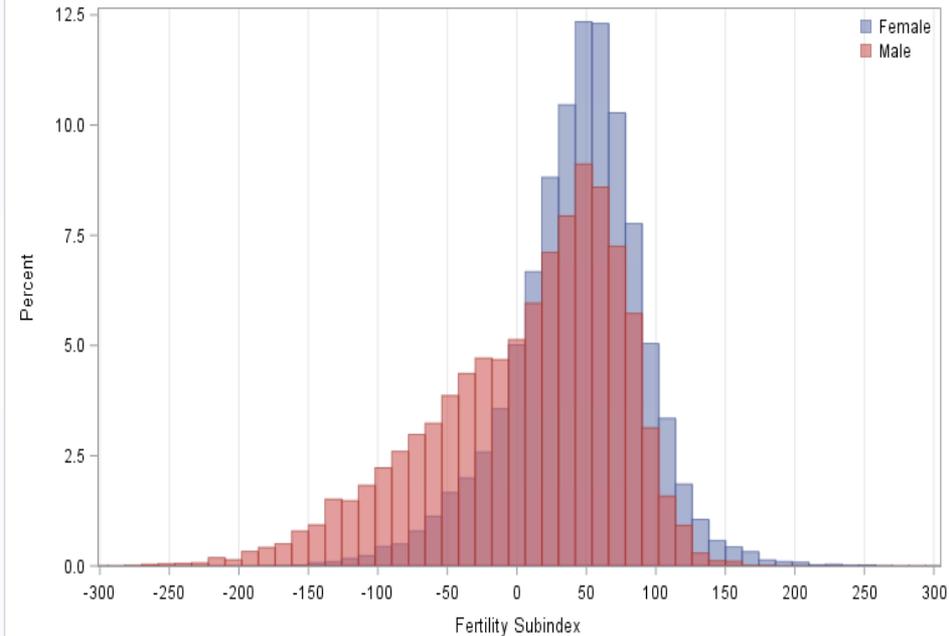
Sex	N	Mean	Std Dev	Minimum	Maximum
Male	10690	26.29162	38.78305	-120.88	165.86
Female	19934	35.69475	32.44963	-130.5	180.08
All	30624	32.41237	35.07861	-130.5	180.08

Training Population Fertility traits

**Fertility Subindex for training population
Multibreed males and females in training population**



**Fertility Subindex for training population
Multibreed males and females in training population**



Sex	N	Mean	Std Dev	Minimum	Maximum
Male	8591	6.048867	68.75077	-328.02	182.2
Female	19284	43.4668	47.31685	-183.21	311.36
All	27875	31.93469	57.48042	-328.02	311.36

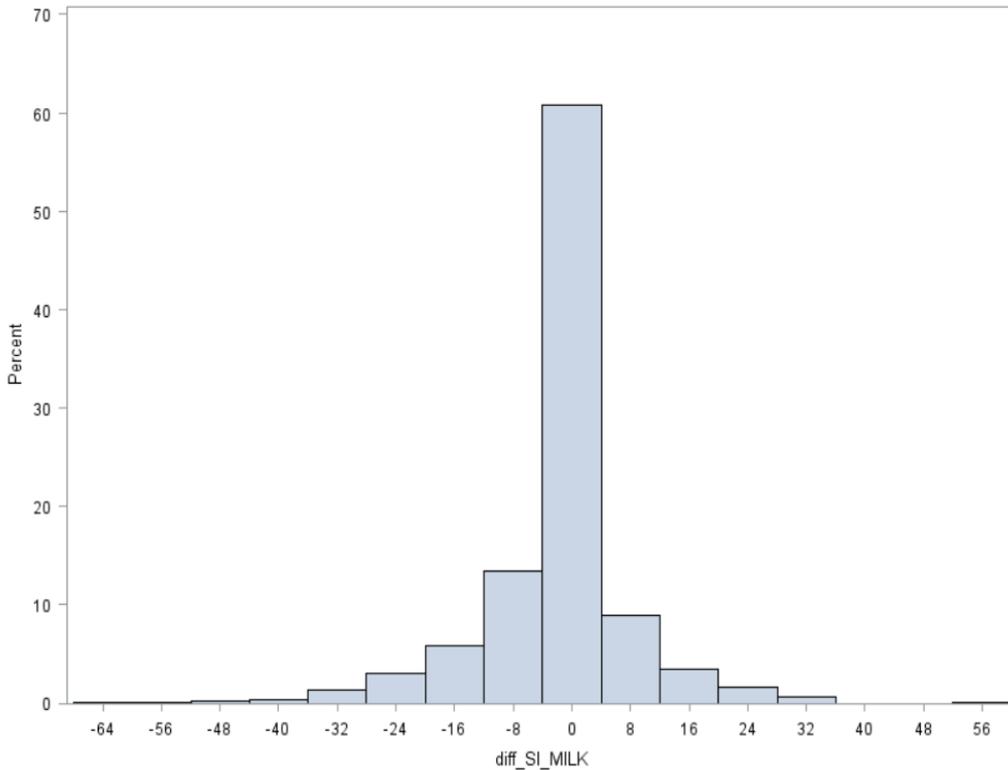
Validation results

Validation based on de-regressed EBV from current evaluation for 262 sires born after 2010 with at least 50 daughters in milk

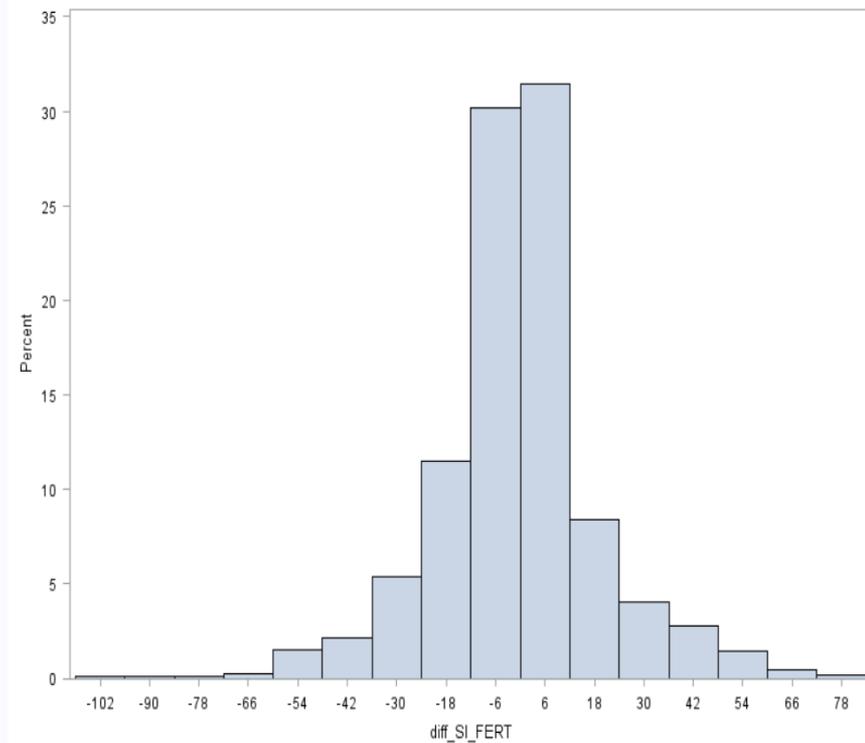
Traits	Validation	EBV	Current GEBV (males in training)	New GEBV (males + females in training)
Milk	Correlation	0.61	0.68	0.73
Fat	Correlation	0.43	0.56	0.62
Protein	Correlation	0.51	0.64	0.68
SCC	Correlation	0.58	0.62	0.68
CIV	Correlation	0.37	0.40	0.43

Impact of new genomics Active sires

Active sires: difference New v old Milk Sub-index



Active sires: difference New v old Fertility Sub-index



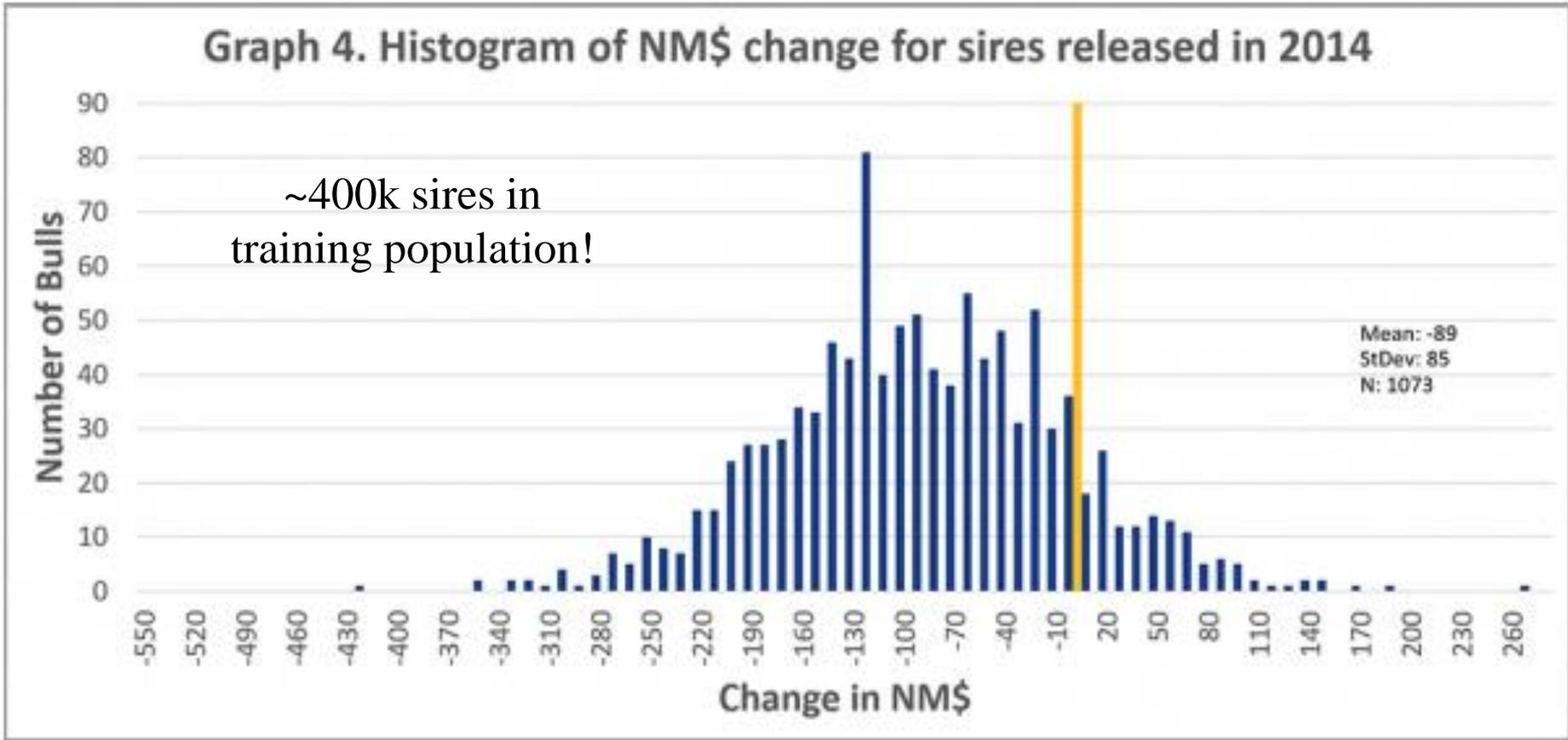
- Larger impact on fertility sub-index

Summary

- Addition of females to the training population will cause re-ranking of sires
 - Females closely related to Active sires
 - Increased mean and sd for milk and particularly fertility
- Moving away from publication rules i.e. GS vs DP
- Sires and cows will now continue to have genomic component in all traits



Experiences with genomics in the US



Overview

1. Calving Evaluation

EBI

- From 1 trait to 4 traits

2. Genomics

EBI

- Genomic evaluations for cross bred animals

3. Maintenance SI

EBI

- PTA change from cull cow weight to live weight

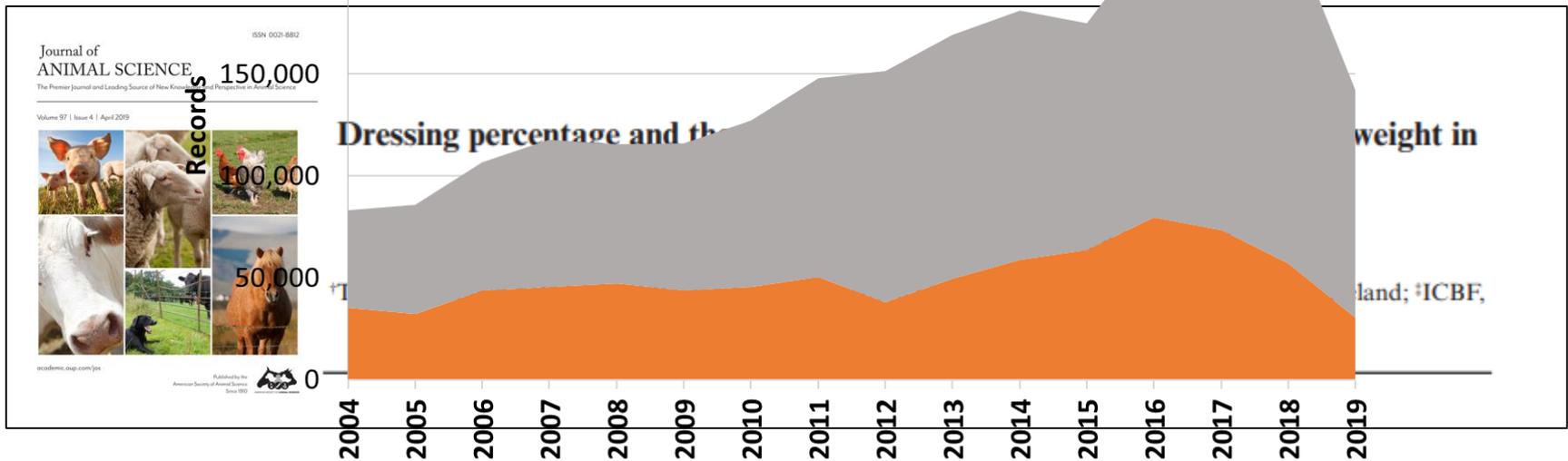
4. Dairy Beef Index

DBI

- Roll out to stock bulls and young pedigree breeding bulls
- Screens for first time

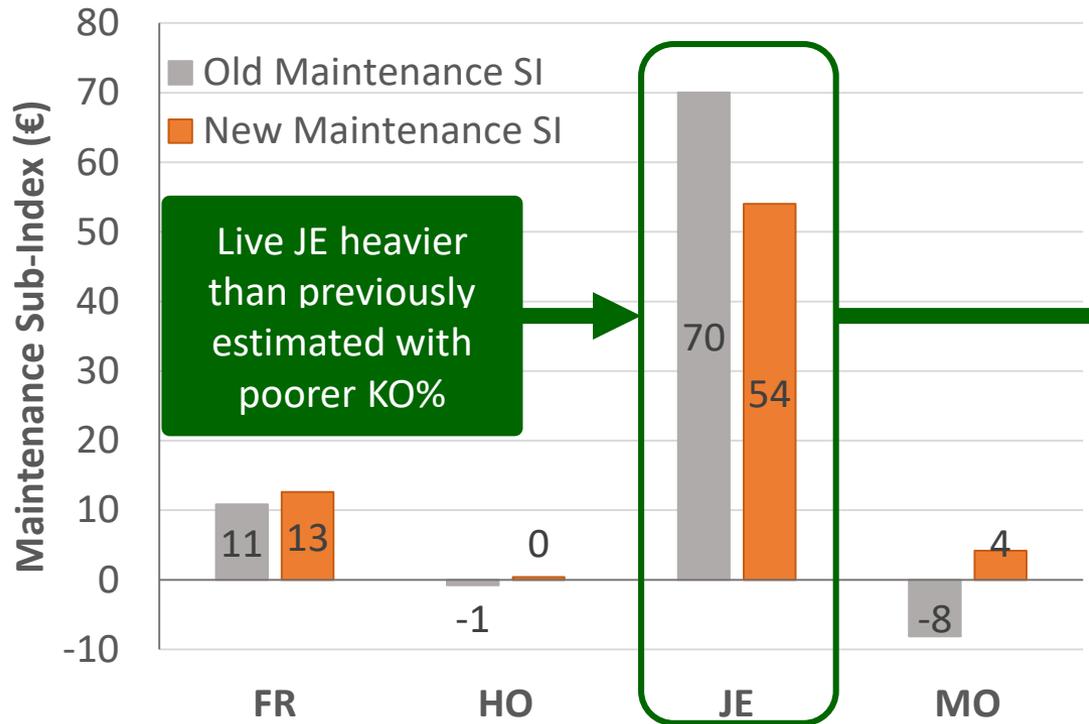
Maintenance Sub-Index

- Current Maintenance SI = (Cull Cow Weight PTA * EW)
- New Maintenance SI = (Live Weight PTA * EW)
- Historically, Maint SI derived solely from cull-cow weights
 - Live weights were not available / cull cow weight records were more abundant
 - In general, a heavier cow liveweight results in a heavier carcass, and vice versa
 - However, cull cow weight records are more abundant than live weight records (0.74 genetic correlation)
 - E.g., Kill-Records (43%); Coyne (19)



Maintenance Sub-Index

- Maintenance SI now more reflective of cow liveweight on-farm
- Almost no change in Maintenance SI Reliability



Based on Alive AI bulls Nov'19 evaluation

Kill-Out%	Assumed	Actual
	45%	43%
Cull Cow Weight	200 kg	200 kg
Assumed Live Weight	444 kg	465 kg
Difference	At 43% kill-out, the JE cow has a 21 kg heavier live weight, thus higher maintenance costs	

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DBI

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Our Farmer & Government Representation



Our AI & Milk Recording Organisations



Our Herdbooks



Acknowledging Our Members