IRISH CATTLE BREEDING FEDERATION

ICBF Dairy & Beef Industry Meetings.

Meeting 1 – Dairy Only.

25th July 2012.

National Development Plan
Transforming Ireland

Agenda 1 – Dairy (10.00-12.00).

- New management traits – Donagh Berry, Teagasc.
- Labour survey – Kevin Downing & John McCarthy, ICBF.
- Linear type – Jessica Coyne & Donagh Berry, Teagasc.
- Culling indexes – Margaret Kelleher, Teagasc.
- Genomics – Francis Kearney, ICBF.
- Teagasc Next Generation Dairy Herd – Sinead McParland, Teagasc.
- G€N€ IR€LAND Dairy – Andrew Cromie, ICBF & Sinead McParland, Teagasc.
- AOB.

Management traits

Donagh Berry[1], Jessica Coyne[1], Sinead McParland[1], Brian Enright[2], Brian Coughlan[2], Martin Burke[2], Andrew Cromie[2]

[1]Teagasc, Moorepark, Ireland *[2]ICBF*

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ICBF Dairy Industry Consultation Meeting, July 2012

Re-cap on meeting - Nov'11

- Dairy Efficiency Program (DEP) data
  - Temperament, mastitis, lameness
  - Very good quality data
  - Heritability estimates in line with international estimate
  - Ample genetic variation to make gains

Management traits

- Milking speed
- Temperament
- Farmer satisfaction, farmer opinion, workability, likeability

- Already account for: calving difficulty, lameness, mastitis

Objective Data

- DIY milk meters
- Average milk yield recorded every 5 seconds
  - Milking duration
  - Flow rates (max., average)
- 370,597 records from 121,335 lactations on 1,365 farms during the year 2012

Subjective Data

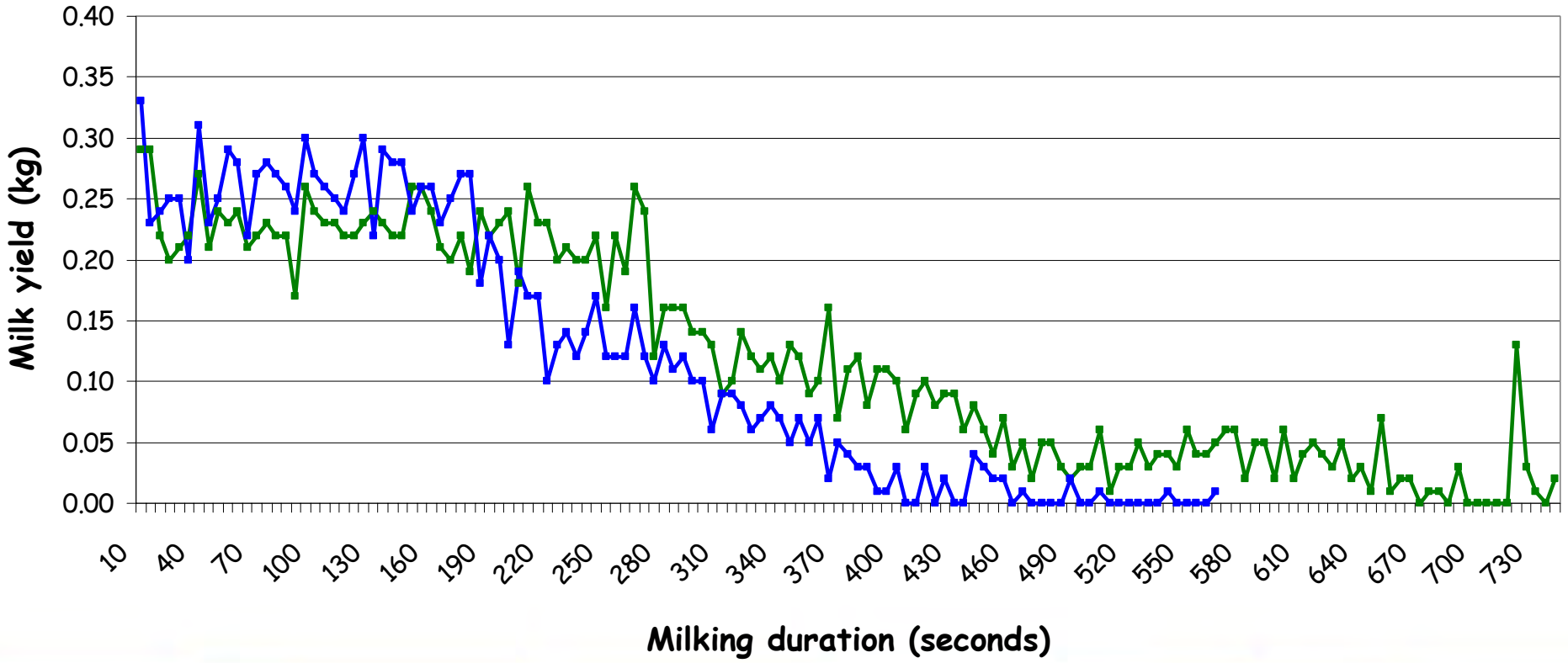
- IHFA scored milking ease and temperament
  - 69,810 records
  - Scale 1 to 9
- Gene Ireland scored
  - 27,189 records
  - Scale 1 to 5

Objective

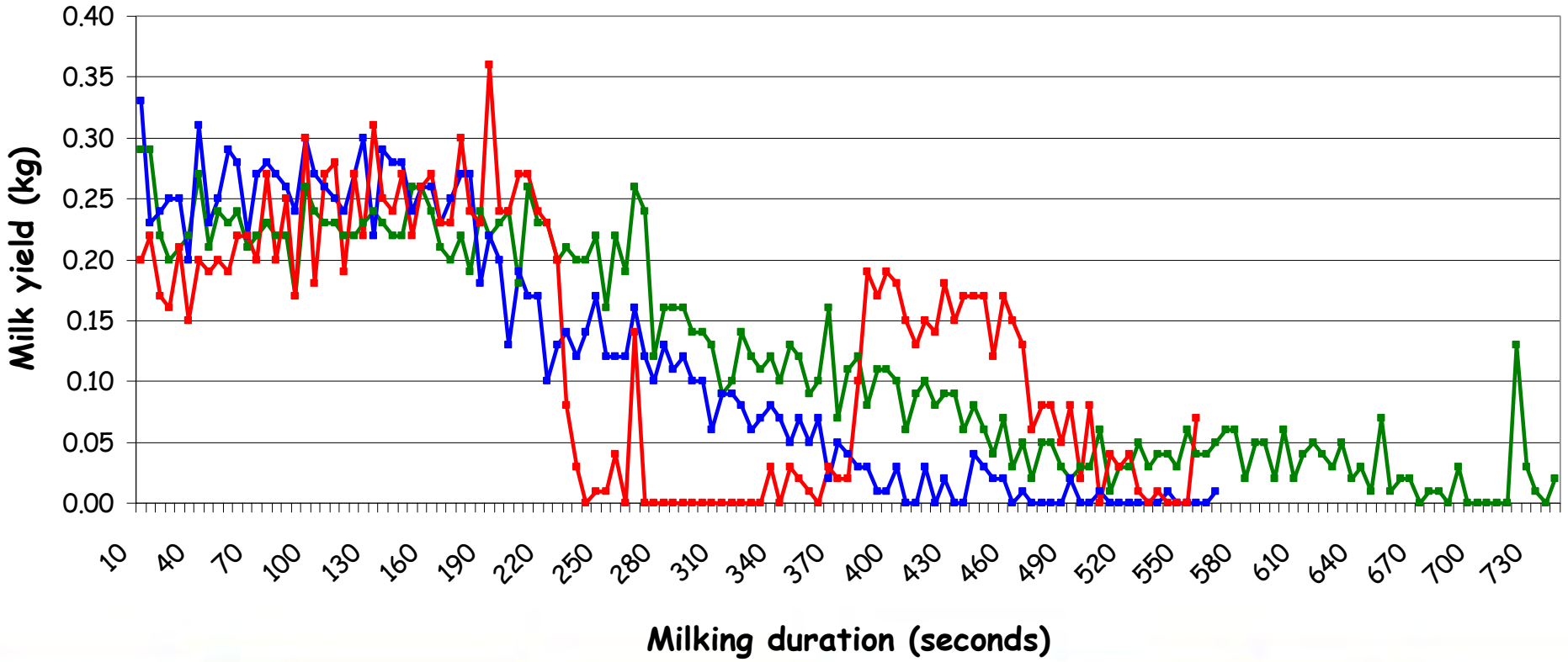
- Quantify the variation in milking speed and ability of animal breeding to reduce milking speed (without influencing milk yield)

- Extent of similarity between objectively and subjectively scored milking speed

Milk flow characteristics



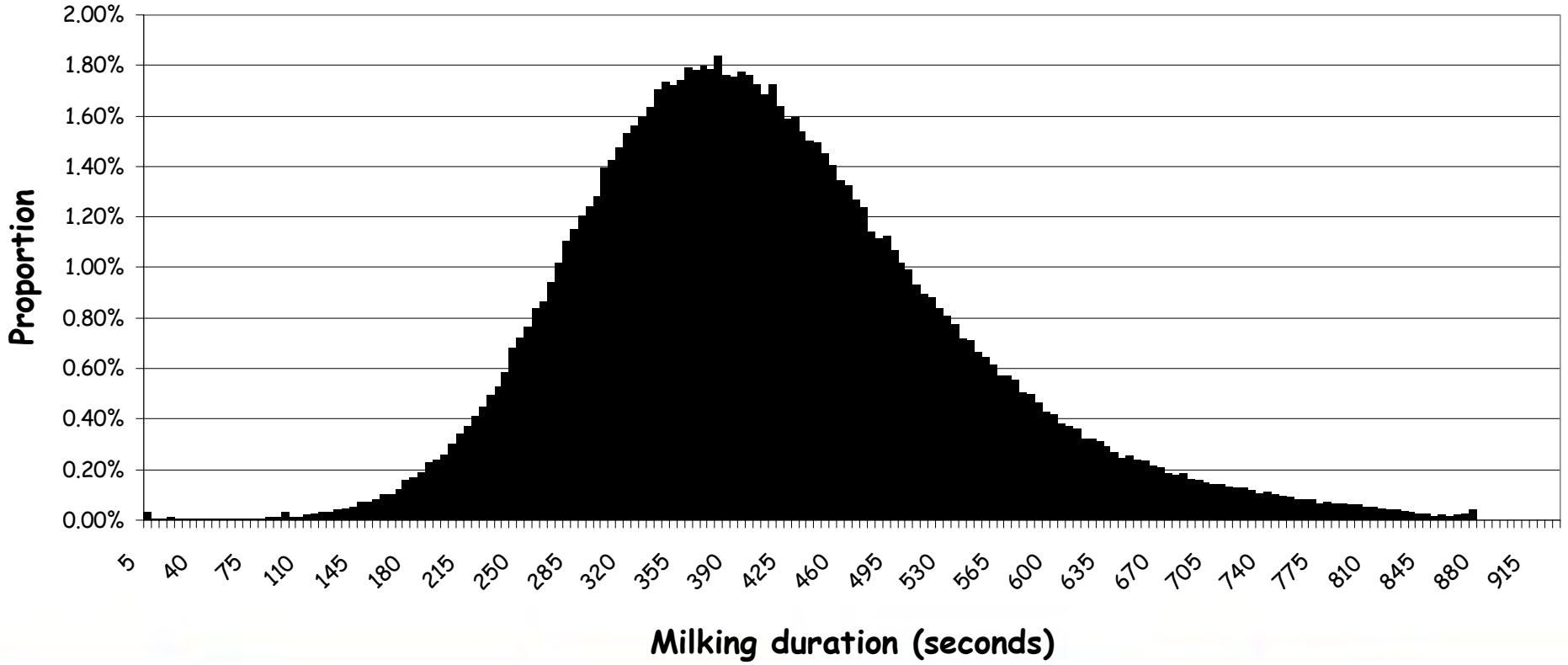
Milk flow characteristics



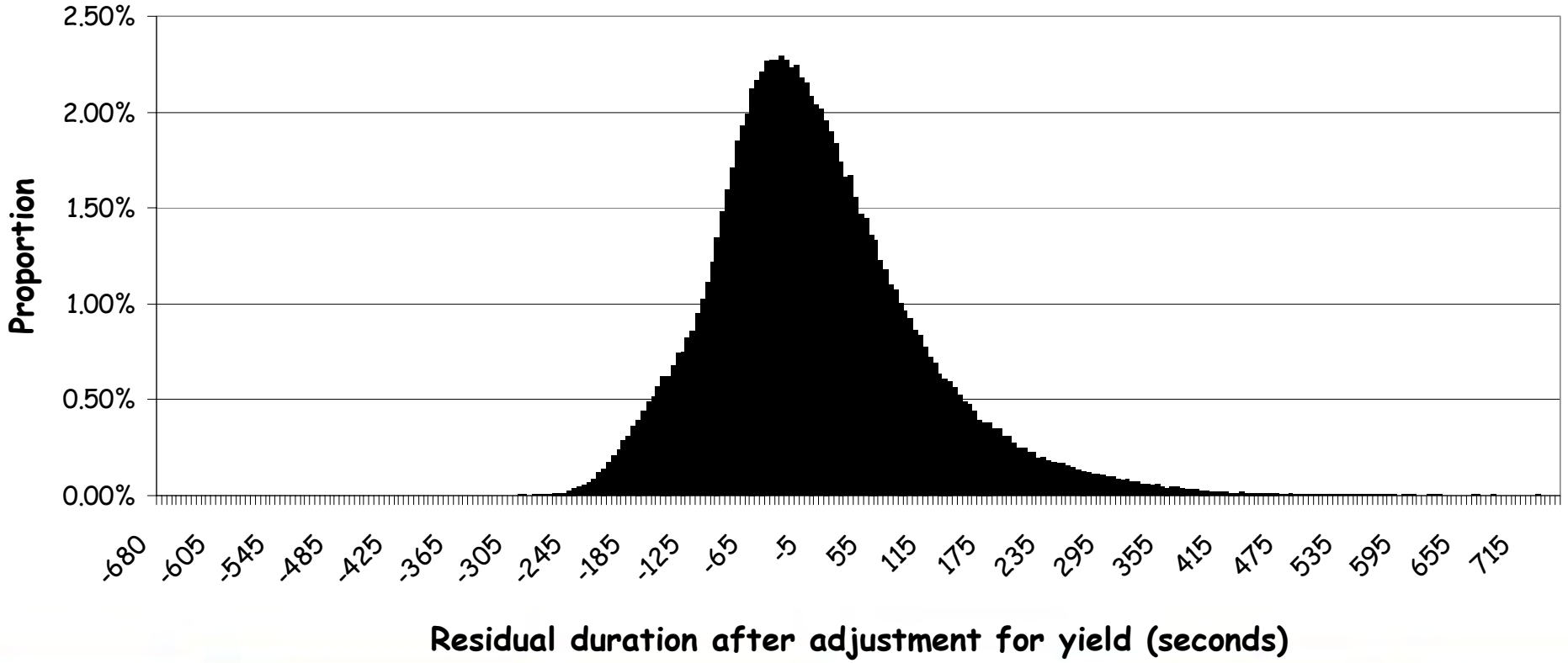
Approach

1. Ensure not selecting for lower yielding animals
   - Milking speed genetically independent of milk yield
2. Ensure not selecting for more mastitis through weaker teat end sphincter muscle
   - Include SCC and mastitis in EBI and monitor response to selection
   - Derive trait independent of both milk yield and SCC

Milking duration



Residual milking duration – effect of milk yield removed



Preliminary analysis – nongenetic

Trait	Duration	Residual duration	Milk yield	Gene Irl. speed	IHFA ease
Residual duration	0.90				
Milk yield	0.37	0.00			
Gene Irl. speed	-0.09	-0.10	0.04		
IHFA ease	-0.04	-0.04	0.01	0.21	
SCC	-0.03	0.02	-0.12	0.22	-0.01

Ample variation not simply due to milk yield

Preliminary analysis – nongenetic

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Residual duration	0.90				
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IHFA ease	-0.04	-0.04	0.01	0.21	
SCC	-0.03	0.02	-0.12	0.22	-0.01

Not very good indicators - expected

Subjective *versus* objective

Remember different scales

Preliminary Analysis – genetic

- Heritability
  - Milking duration – 0.17
  - Residual milking duration - 0.11
- Repeatability
  - Milking duration -0.45
  - Residual milking duration – 0.32
- Genetic SD for residual milking duration – 17 seconds (per milking)
  - Top 15% versus bottom 15% threshold 70 second daily difference
    - 6 hours over 305 days
    - €75 (Equivalent of €326 for calving interval)

To do list

- Generate a management genetic evaluation
  - Milking speed, temperament, milk yield, SCC….
- Estimate economic values
- Submit new genetic evaluation to INTERBULL

Labour Index

- NL: Yvette de Haas, Ina Hulsegge, Roel Veerkamp (Wageningen UR Livestock Research)
- IRL: Andrew Cromie, John McCarthy, Kevin Downing (ICBF)
- NZl: Tim Byrne (AbacusBio Ltd.)

LIVESTOCK RESEARCH
WAGENINGEN UR

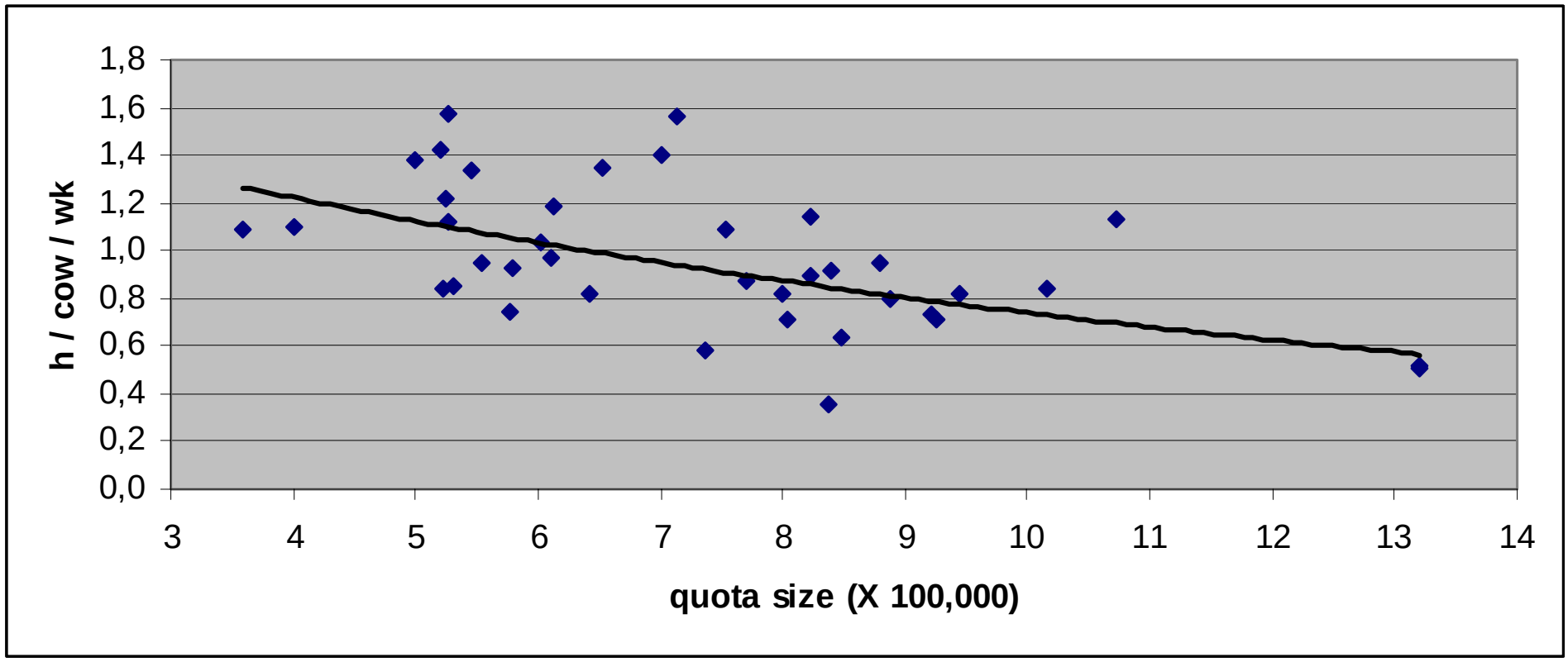
ABACUSBIO LIMITED

ICBF.com

Labour Index

- Increasing Herd Size will result in less time available to spend per cow
  - Farmers want “easy-care” cows
- Questions is: How can breeding be used to achieve that?
- Answer: Possible inclusion of Labour in the EBI (sub-index or distributed in existing traits)

Relationship between hours per cow per week and farm size (source: 39 Dutch dairy farms)



Consultation Process

- Farmers meeting – June 7th, Moorepark
  - Blackwater Discussion Group – 11 farmers
  - Discussion on Traits for inclusion
  - Evaluated 1st Model
  - Updates made – inclusion of 1000minds software (ICAR Conference)
- Farmers Meeting - June 29th, Moorepark
  - Dairymis Discussion Group – 10 Farmers
  - Discussion on Traits for inclusion
  - Evaluated 2nd Model
  - Updates made – updating traits definitions/presentation, etc.
- Emailed 200 farmers – July 17th
  - Checking the technology
  - Telephone follow-up
- Emailed 800 farmers – July 23rd
  - Dataset 1 – 3,000 more to follow

Labour Trait Selection

- Milking process
  - Milking speed
  - Lazy/keen cows
  - Temperament
  - Udder health (SCC)
  - Udder conformation
- Cow Health & Care
  - Metabolic disorders
  - BCS recovery
  - Lameness
- Calving & Calf Care
  - Calving Difficulty
  - Weak Calves
- Fertility
  - Repeat Breeders
  - Non-Cycling Cows/Silent Heats

Labour Index Survey

- First part of survey:
  - high level picture of the importance of labour related to certain aspects of the production system
- Second part of survey:
  - a more detailed view of the importance of improvements in one trait relative to other traits
  - Different combinations of two alternatives and asking you to choose which of the two alternatives you prefer
  - an improvement in a trait always results in a reduction in **labour** in your herd !!

Labour EBI Subindex survey

Categories of Labour

- Please specify the percentage importance you place on each of these categories, from the viewpoint of the labour involved in dealing with these traits.
- On the next screen you will be asked about the breakdown of the traits within each of these four categories.

Category	%
Milking process	
• Temperament - Labour associated with temperamental cows during milking • Milking speed - Labour associated with slow milking cows • Lazy cows - Labour associated with cow walking speed (independent of lameness) • Mastitis - Labour associated with mastitis/high scc • Udder conformation - Labour associated with cows with poor udder conformation (which affects cluster attachment)	
Cow health and care	
• Lameness - Labour associated with lameness • Metabolic disorders - Labour associated with (grass tetany/milk fever/displaced abomasum) • BCS (Body Condition Score) recovery - Labour associated with cows which require separation and addition feeding in the dry season	
Calving and calf care	
• Calving difficulty - Labour associated with difficult calvings • Weak, lethargic calves - Labour associated with weak calves that require help in feeding in the early stages of life	
Fertility	
• Repeat breeders - Labour associated with cows requiring repeat AI • Non-cycling cows/Silent heats - Labour associated with cows that do not cycle or have silent heats	
Total	0

Labour Index

Labour EBI Subindex survey

page 3 of 9.

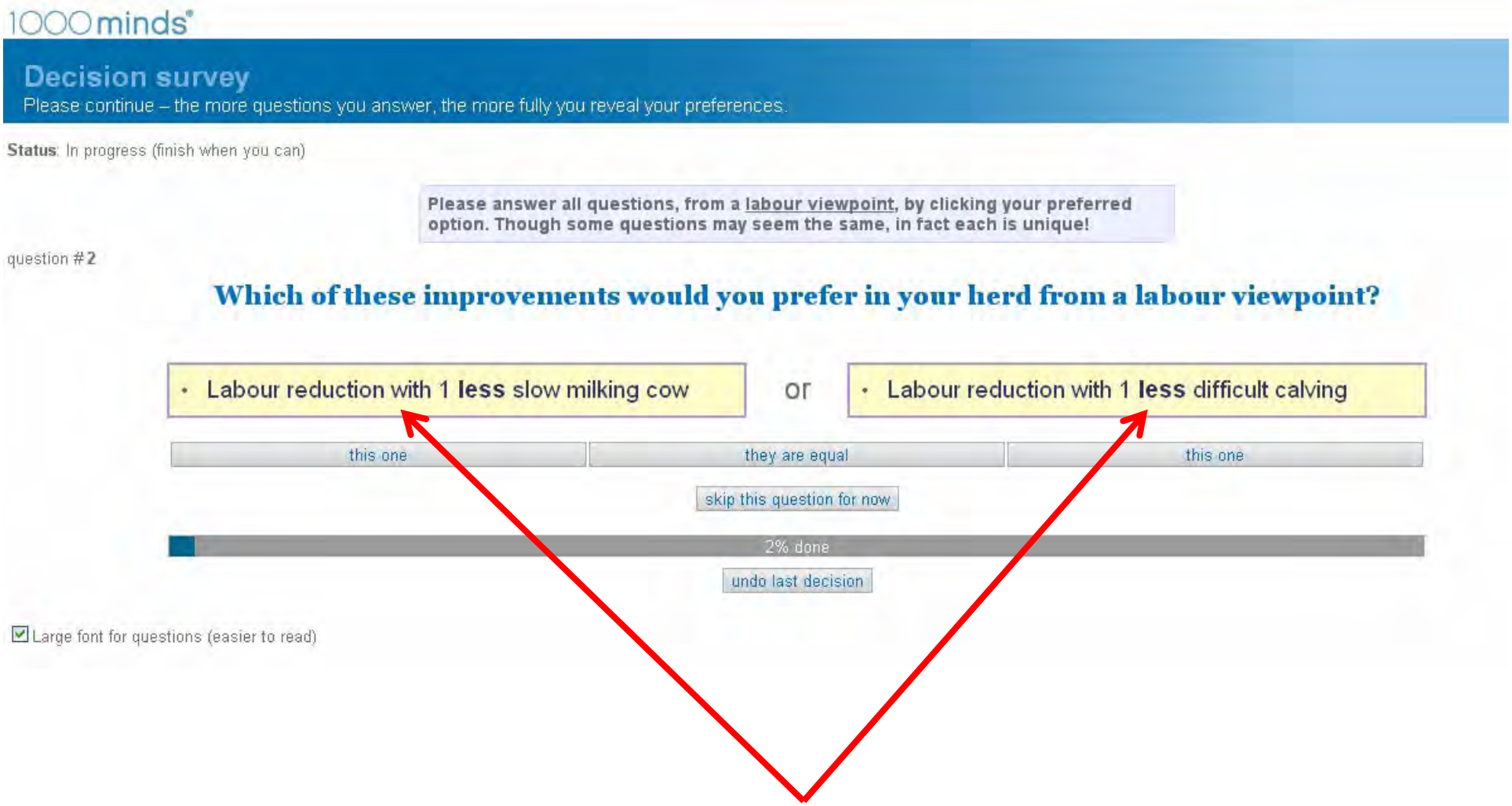
Milking Process

- Please divide the percentage you have allocated for milking process (25) across the 5 traits here.
- Put 0 for a trait (or leave it blank) when you think problems with this trait do not influence the labour per cow on your farm.

Category	Trait	%	Total %
Milking process	Temperament	11	25
	Milk speed	3	
	Lazy cows (locomotion/walking speed)	2	
	Mastitis/SCC	4	
	Udder conformation	5	
	Total milking process	25	

Next

Labour Index



Trade off

Next Step

- Complete Survey with 4,000 dairy farmers
- Collate data and calculate economic values – Aug/Sept
- Present results & feedback – Oct.
- Decide on whether/how to include in EBI – Nov/Dec
  - Generate lists of cows & bulls
  - Do the proofs make sense? Are cows with high indexes “easier to manage”?

Genetic Evaluations of Linear Type Traits in the Irish Dairy Cattle Population

Jessica Coyne
Teagasc, Moorepark.
ICBF Industry Meeting, Portlaoise, July 2012.

The Irish Agriculture and Food Development Authority

Motivation

- Joint linear evaluation with Great Britain
- Same trait in both countries was assumed to be genetically identical

- **Objective:**
  - Generate a statistical model more reflective of Irish production system
  - Re-estimate heritability values and variance components

The Data

- Records on 27 type traits were extracted from the ICBF database for 192,423 Holstein-Friesian dairy cows
- Data from 1983 – 2011 retained
- 22 traits were scored on a linear scale of 1 – 9
- 5 subjective traits scored on a scale of 40 – 100
- New model developed on 46,378 dairy cows
- Bull proofs produced on 110,717 records

Data Edits

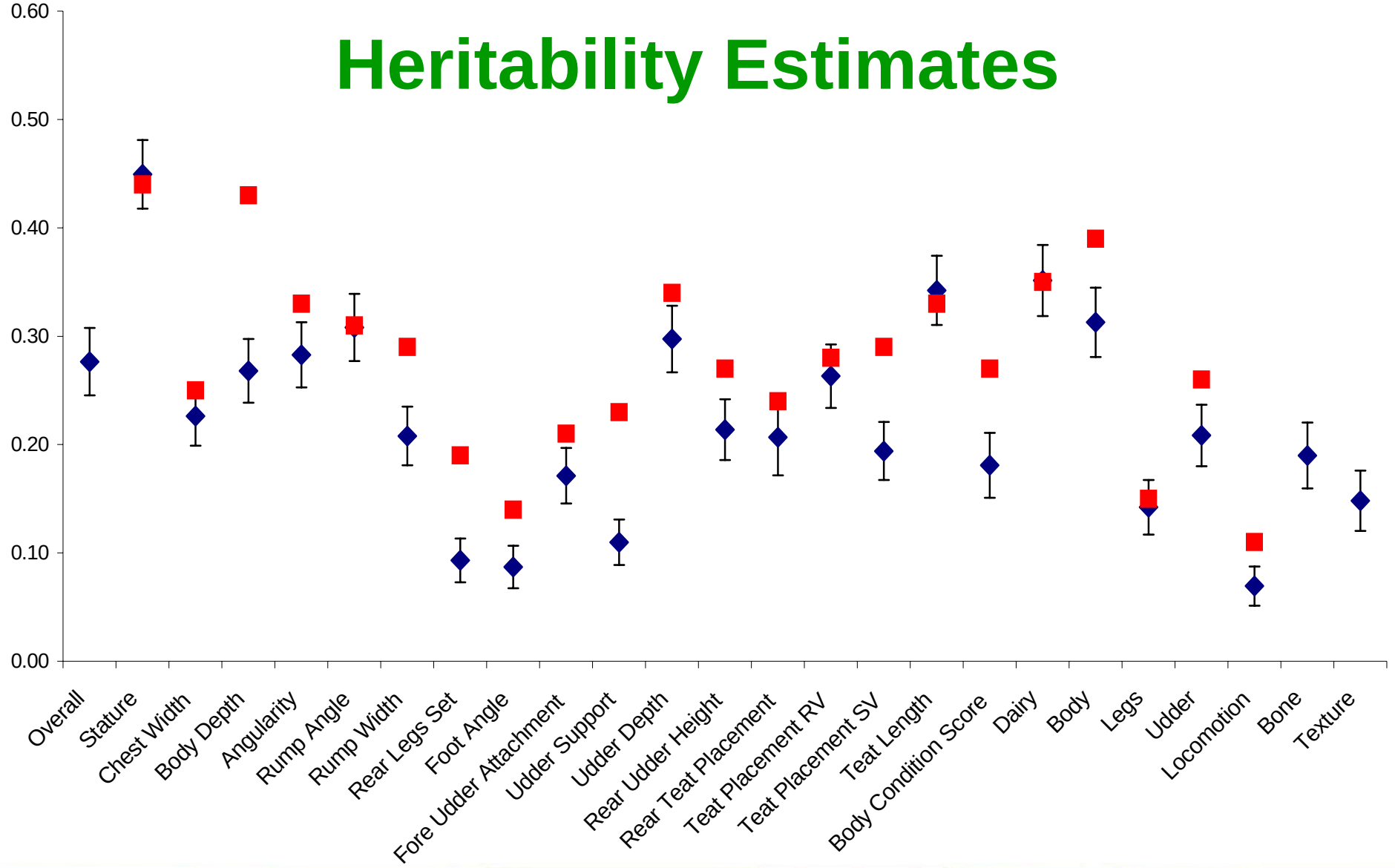
- Final edits applied:
  - First lactation record was retained; in line with International approaches
  - First linear type record in time per animal was retained
  - Cows had to be aged from 18 – 50 mths at inspection
  - Variation among field officers was standardised to a common variance
  - Days in milk divided into 11 classes, 30 days per class, and ran from 0 to 330 days
  - Age at first calving was classed from 21 - 38 mths of age (inclusive)

New Model – Heritability Estimates

- Animal Model was used
- Fixed effects were:

Old Model	New Model
Herd–Year of Visit	Herd–Date of Classification
Month of Calving	Month of Calving
Lactation Stage	Lactation Stage
Age at Inspection	Age at First Calving
	Heterosis
	Recombination

Heritability Estimates



Correlation of Proofs

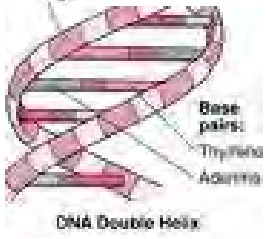
Traits	Evaluation 2011_2012
Stature	0.994
Body Depth	0.979
Angularity	0.996
Chest Width	0.981
Rump Angle	0.989
Rump Width	0.977
Body Condition Score	0.987
Udder Support	0.919
Udder Depth	0.942
Teat Placement RV	0.988
Teat Placement SV	0.975

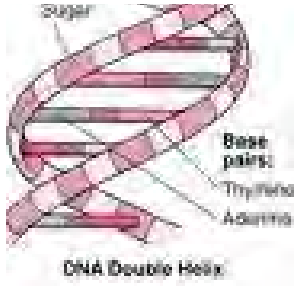
Correlation of Proofs

Traits	Evaluation 2011_2012
Teat Length	0.987
Rear Teat Placement	0.983
Rear Udder Height	0.989
Fore Udder Attach	0.990
Rear Legs Set	0.946
Foot Angle	0.968
Legs	0.985
Locomotion	0.966
Udder	0.976
Dairy	0.995
Body	0.992

Dam

No Lineage Effect





Conclusion

- Model more reflective of the Irish production system
- No significant change in bull proofs
- The evaluation implementing the new model is being submitted to Interbull for the September test run

Genetics of defective type characteristics in Irish Holstein-Friesians

Donagh Berry[1] & John McCarthy[2]

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ICBF Dairy Industry Consultation Meeting, July 2012

Teagasc
Agriculture and Food Development Authority

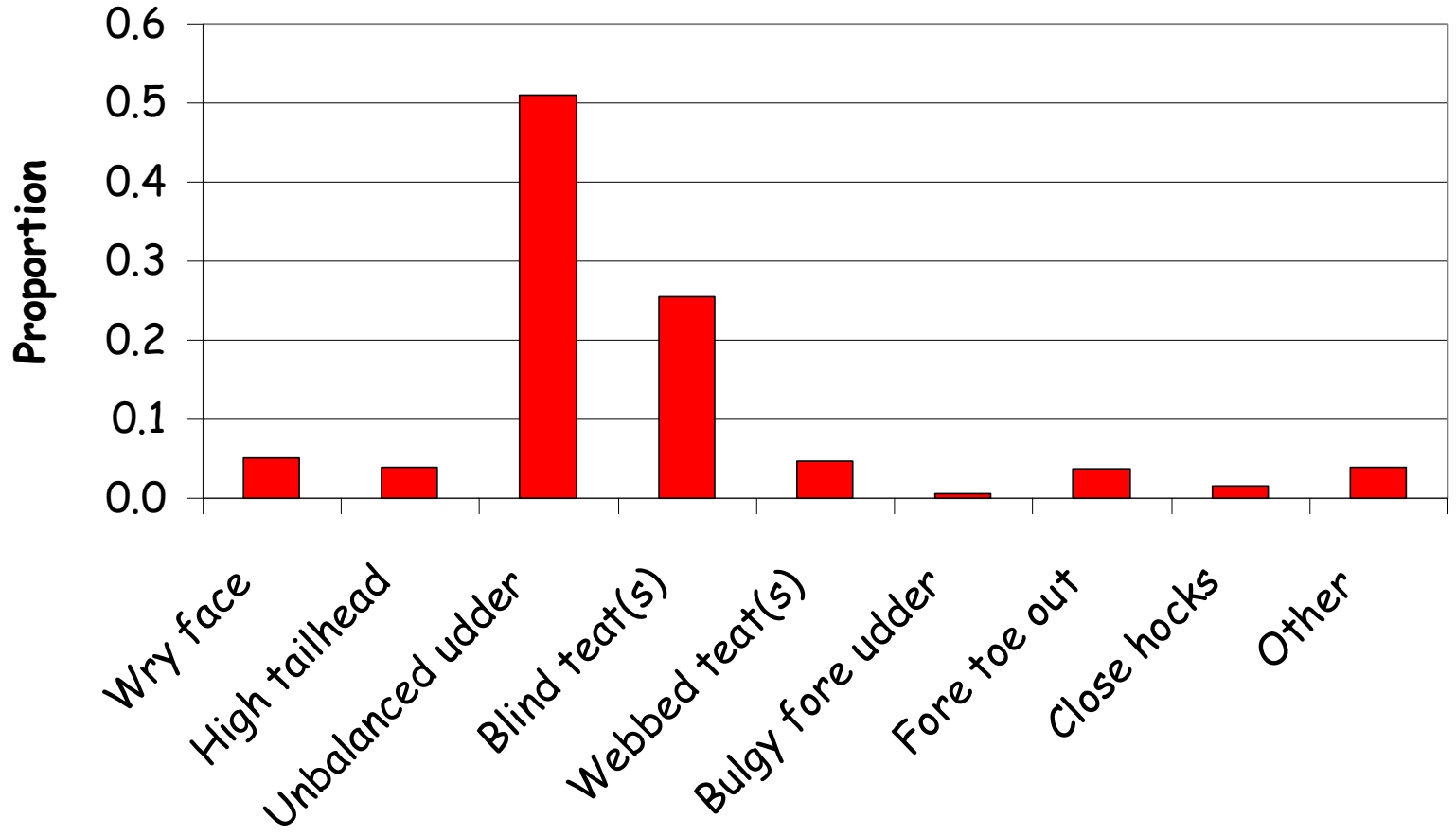
The Irish Agriculture and Food Development Authority

Motivation

- Genetic gain will increase rapidly with genomic selection
  - Less opportunity to purge out unfavorable unselected characteristics
- Currently observing international genetic bottleneck
  - Oman and Shottle bloodlines
  - Greater inbreeding (depression)
- Need to be vigilant for unwanted correlated responses to selection (for everything!!)

Data

- 13,709 records from 12,471 cows in 1,206 herds
- Years 2002 - 2012



Heritability estimates

Trait	Heritability
Wry face	None
High tailhead	None
Unbalanced udder	None
Blind teat(s)	None
Webbed teats	None
Bulgy udder	None
Fore toe out	0.01
Close hocks	None

- Are these data being recorded accurately??
  - Is their importance being sufficiently stressed?
- Genetic defects should exhibit heritability

Conclusions

- Complete and accurate recording of such traits is vital to unsure no deleterious effects if selection
  - Need to stress this!!
- Facility should also be encouraged nationally
- Some effects might only be observed when two carriers mate (25% of these matings)

Cow Production Index (CPI)

Margaret Kelleher

Teagasc, Moorepark

Margaret.Kelleher@teagasc.ie

ICBF industry meeting, Portlaoise, Ireland, July 2012

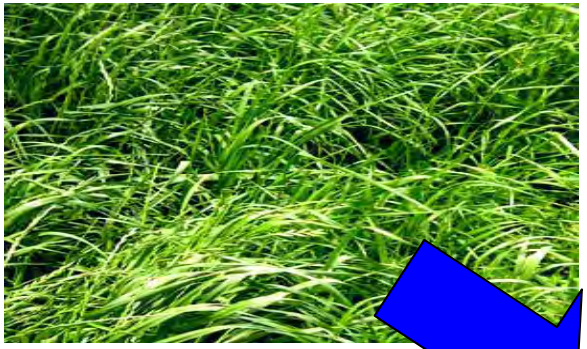
Why a cow production index?

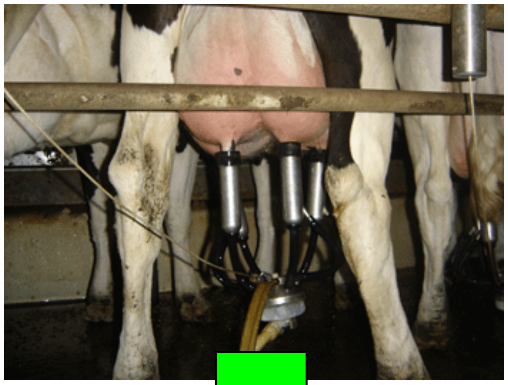
- The EBI is based on superior additive genetic merit (genes passed on to the next generation) to produce more profitable progeny
- A tool used for BREEDING

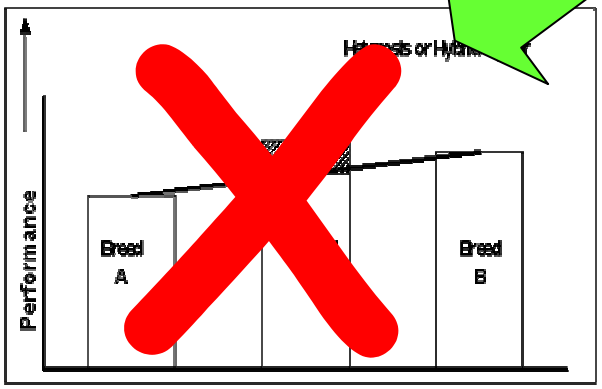
Not included in EBI

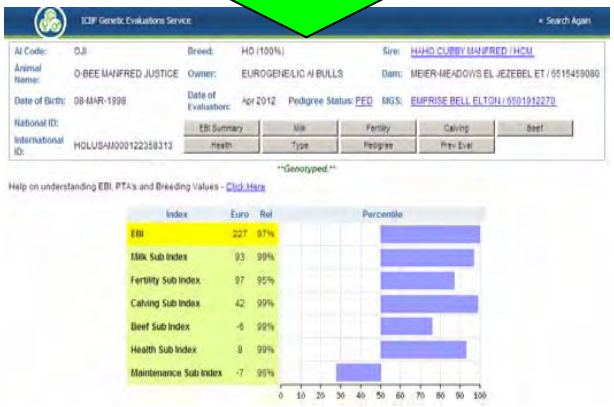
- **Non-additive genetic effects**
  - Heterosis
    - gain in performance due to crossbreeding
  - Recombination loss
    - loss in performance due to later stages of crossbreeding

- **Permanent environmental effects**
  - Environmental effects that permanently affect the animal
    - Heifer rearing (mis) management
    - Injury

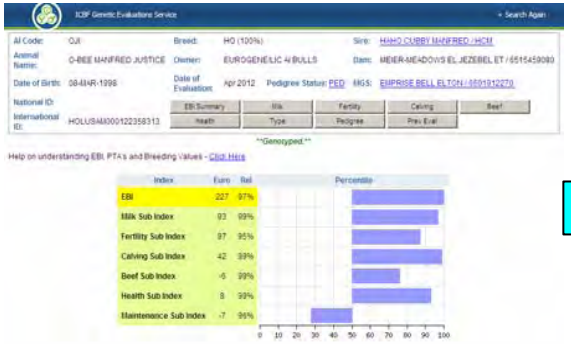





Performance
Breed A
Breed B

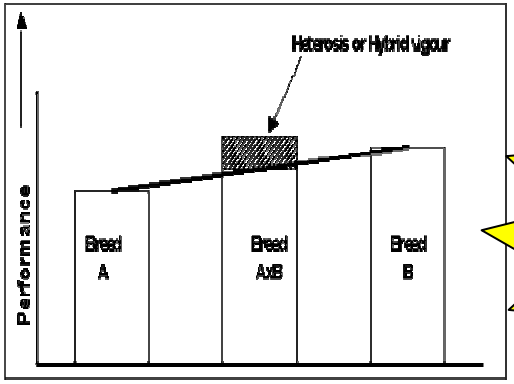

ICBF Genetic Evaluations Service
Search Again
AI Code: OJI
Breed: HO (100%)
Sire: HAHO CUBBY MANFRED / HCM
Animal Name: O-BEE MANFRED JUSTICE
Owner: EUROGENE/LIC AI BULLS
Dam: MEIER-MEADOWS EL JEZEBEL ET / 9515459080
Date of Birth: 08-MAR-1998
Date of Evaluation: Apr 2012
Pedigree Status: PED
MGS: EMPRISE BELL ELTON / 6501912270
National ID:
International ID: HOLUSAM000122358313
EBI Summary
Milk
Fertility
Calving
Beef
Health
Type
Pedigree
Prev Eval
Genotyped.
Help on understanding EBI, PTA's and Breeding Values - Click Here
Index
Euro
Rel
Percentile
EBI 227 97%
Milk Sub Index 93 99%
Fertility Sub Index 97 95%
Calving Sub Index 42 99%
Beef Sub Index -6 99%
Health Sub Index 8 99%
Maintenance Sub Index -7 95%
0 10 20 30 40 50 60 70 80 90 100

Cow Production Index =



EBI

(additive genetic effects)



NEW

Heterosis and Recombination

(non-additive genetic effects)

NEW

Permanent Environment

(non-genetic effects)

Milk Breeding Index

Genetically
very similar cows

COW A

Purebred

Holstein

COW B

Crossbred

Jersey X Holstein

Comparing the EBI to CPI

	Milk EBV Breeding value	Milk KG Actual milk yield	Milk CPI New production value	Heterosis effects	Permanent environment
COW A HO	31	4215	9	+0 kg	+7 kg
COW B JExHO	32	4766	148	+84 kg	+47 kg

+551kg

Very similar cows

Milk yields very different

CPI able to detect differences

More traits

	Fat EBV Breeding value	Fat KG Actual fat yield	Fat CPI New production value	Heterosis effects	Permanent environment
COW A HO	14.5	214	22	+0 kg	+5.4 kg
COW B JExHO	14.0	165	16	+5 kg	-3.7 kg

+49kg

Very similar cows

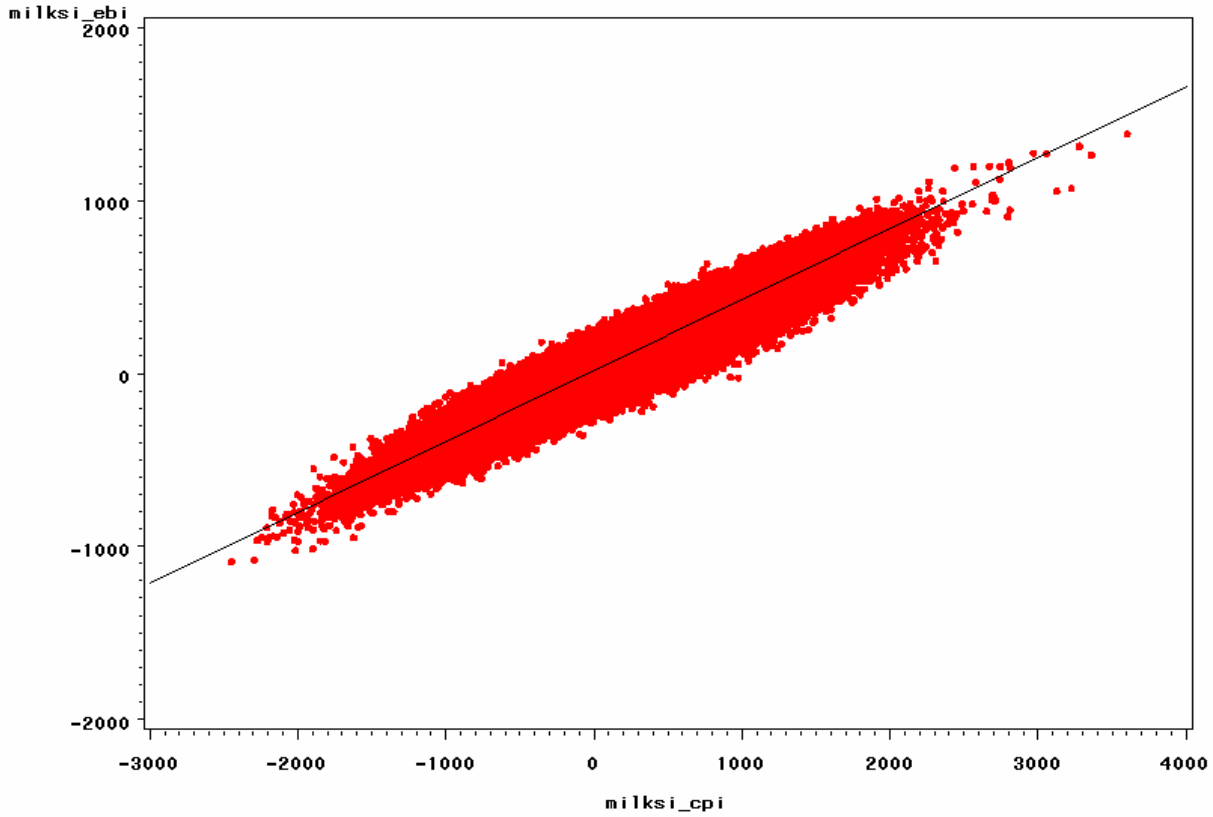
Fat yields very different

Holstein was underestimated by breeding index

Differences due to …

	ALL HERDS	CROSSBRED HERDS
Additive genetics	78%	70%
Permanent environment	19%	25%
Heterosis	3%	4%
Recombination	0.3%	0.8%
DIFFERENCES due to other effects other than additive genetics	22%	30%

Correlation between cow proofs



Milk sub-index CPI

Milk sub-index EBI

r=0.95

Ranking of top 10 animals

CPI ranking	CPI for Milk	EBI ranking
1	607	3
2	478	30
3	473	23
4	450	7
5	446	1
6	416	5
7	402	22
8	389	37
9	380	38
10	373	4

- Heterosis and Recombination effects
- Permanent Environment effects

Production index summary

- ✓ Predict the future [illegible]ction ability of the cow over [illegible]ng interval
- ✓ Account [illegible]d environmen[illegible]
- ✓ Guide far[illegible] to voluntarily c[illegible] from the herd
- ✓ Create a ranking order for the herd that is more reflective of the herd

Next

FERTILITY

=> re-ranking!!

IRISH CATTLE BREEDING FEDERATION

Genomics Update

Francis Kearney.

National Development Plan
Transforming Ireland

Genomic Update

- Moved to LD (6900 SNPs) chip this year
- Same cost as 3k
- Special offer on female genomics (€30)
- Expected Benefit of LD vs 3k
  - Increased imputation accuracy
  - Better call rates (use of different platform)
  - Can genotype animals of stock bulls even if not done on 50k (except for pure FR)

Genomic Update

- Farmer requested females (2010,2011,2012)
- AI companies
  - Pre-contracted animals done automatically
  - Letter of offer and one hair card is sent when bull is requested by more than one AI company
  - Contract with every hair card
    - Not genotyped without a contract
- Teagasc Next Generation heifers

Genomic Update

	Male	Female
Overall	2680	4834
AI	2353	-
Farmer	147	4681
Herdbook	180	153

- Excellent call rate (98%, 4% re-sampled)
- 20 genomic evaluations since 10th Feb
- Every week during Feb/Mar/Apr
- Turnaround times were on average 23 days for AI requested animals (date hair sample received to results)
- Farmers returning samples is longest step in the process (average=12 days)

Genomic Update – Type traits

- Genomic type evaluations are now being done
- Sizeable training populations for most traits (> 3000 for sta, cw, ang, bd etc)
  - Results will be distributed with the main report with type traits given on a separate page
- Available for all animals after the August Run

Parentage

- Currently running at around 6.5% error rate on sire
- By checking against the sires on file we can reduce the error rate down to 1.5%
- Correcting sires/adding missing sires where possible – owners & IHFA notified of changes

International Aspects

- Interbull are proposing to do an international evaluation for young bulls
  - Each country submits GEBV and evaluation done
  - Less optimal than getting a genotype but useful for screening large number of foreign bulls
  - Test-run for GMACE mid-Sept, routine in 2013
- Genomic evaluations for Irish animals in other countries
  - Farmer/AI company who pays for genotype can pass it to relevant countries- we will facilitate this sharing
  - Weatherbys supplied genotypes to US for QC/validation
    - Availability of GTPI/GNM of males & females in the future but process is unclear at the moment due to on-going discussions in US regarding genetic evaluations

Future Research (with Teagasc)

- One-step evaluation
  - All animals, genotyped or not, are run in a single evaluation.
  - Seamless integration of genomic and non-genomic information
  - Advantages are time saving and optimal use of information, with potentially less bias
  - Major piece of work to integrate one-step into all traits – production, fertility, calving & beef
  - Implementation one step for milk & fertility along with the introduction of the test-day model for milk

Future Research (with Teagasc)

- Other dairy breeds
  - Need to build significant reference population for other dairy breeds (Red breeds & Jerseys)
  - Collaborations required for sharing AI bull genotypes/Interbull fertility proofs needed
  - Target cows thereafter (8 to 10 cows = 1 bull??)

Customised Chip

- LD with extra information now available in US
  - More SNPs for imputation (8500 SNP)
  - Recessives/Trait markers (Blad, CVM, A2 etc)
  - Holstein Fertility Haplotypes (USA research)
  - Additional royalties for certain traits
- Currently under consideration along with relevant parties

Summary

- Genomic process is working very well
  - Excellent uptake, call rates, turnaround times
  - All traits are now evaluated
- Will be meeting with users over the coming months to discuss any changes or improvements required for Spring 2013
- Research is on-going in several areas

Next Generation Herd Update

Sinead McParland

Genetic gain in the national herd

- Genomic selection
  - Faster genetic gain than before
  - Genomic selection of females = faster gain
- Is selection going in the correct direction for all traits of importance?
  - Selection for one trait = inherently negative selection for another trait????
  - Should we always assume a linear response to selection?
  - Traits we don't routinely measure?

Next Generation Herd - Objective

Genetically elite and diverse research herd

1. Breeding cows compatible to Irish grass based production system
2. To facilitate the monitoring of difficult to measure traits
   - Cow health, greenhouse gas emissions, intake
   - Deleterious consequences of genetic selection?
3. To enhance the development of the EBI
   - Identify new traits

Heifers sought

- Elite heifers selected based on EBI
  - Minimum genomic EBI €175
  - Genetic diversity
    - Maximum 7 daughters / sires

- Control heifers to represent the national herd
  - Genomic EBI ~ €100
  - Also a range of sires represented

Identification of heifers for NGH

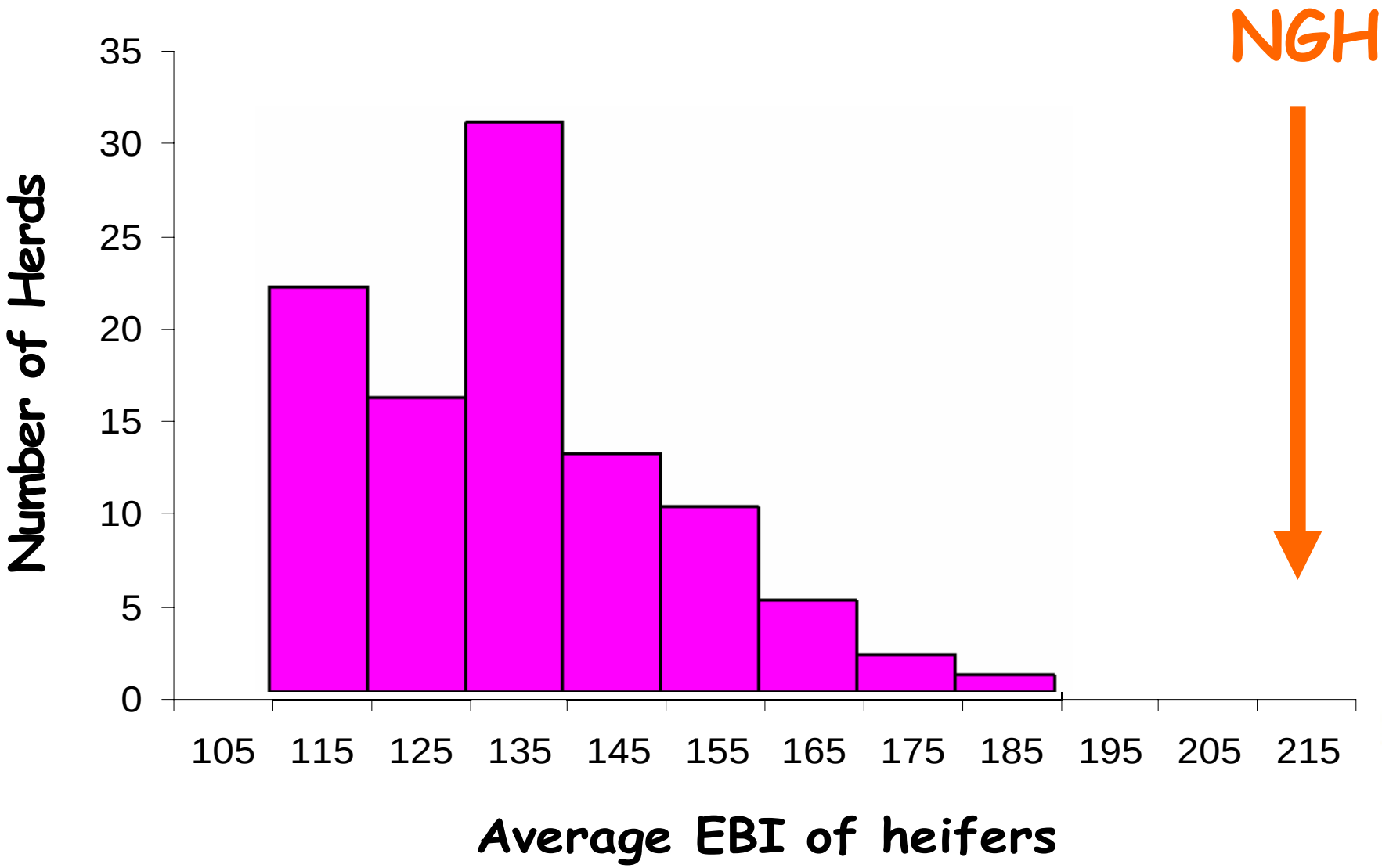
- Heifers identified from the National Herd
  - Letters sent to owners of interesting heifers requesting a genotype
    - 46 heifers bought in
  - Farmers contacted who had "whole herd genotyped"
    - 42 heifers bought in
  - 88 heifers purchased (77 elite + 11 controls)

Elite purchased Heifers Profile

Variable	Mean	Minimum	Maximum
EBI	212	175	274
Milk SI	55	19	97
Fertility SI	140	88	217

- 33 sires (max 7 per sire)
- 60 grandsires
- 49 herds

Is this the Next Generation???



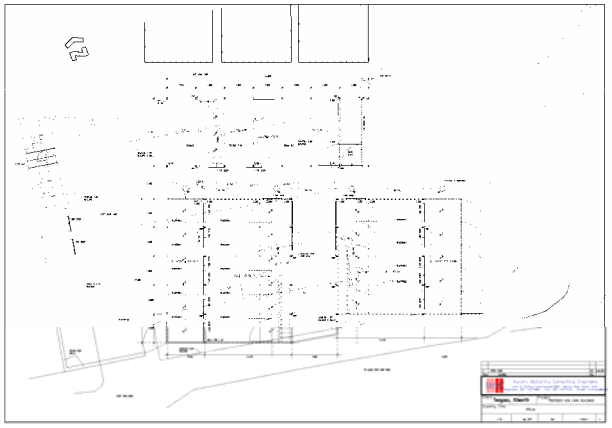
NGH – Kilworth Research Farm

Until now not a self contained unit

Closed herd – independent herd no.

Significant Investment

- New Calving Facilities
- New Calf Rearing Facilities
- New Isolation Unit



Grazing Infrastructure to facilitate study design – 2 Genotypes x 3 Grazing Treatments

Further heifer sourcing ongoing

- Blood samples under analysis from additional elite (and genotyped) heifers
- Controls also currently being sourced
- Calves currently being genotyped

IRISH CATTLE BREEDING FEDERATION

G€N€ IR€LAND Dairy.

Andrew Cromie &
Sinead McParland

25th July 2012.

National Development Plan
Transforming Ireland

What is G€N€ IR€LAND?

- Genetic gain = data + EBI + breeding program.
- G€N€ IR€LAND is service offered by ICBF (& Teagasc) to facilitate National breeding program.
  - Establish optimum design for Ireland.
  - Provide a frame-work for progeny testing.
  - Provide breeding program advice for bull breeders.
- Program reviewed on an annual basis.

G€N€ IR€LAND – Recap.

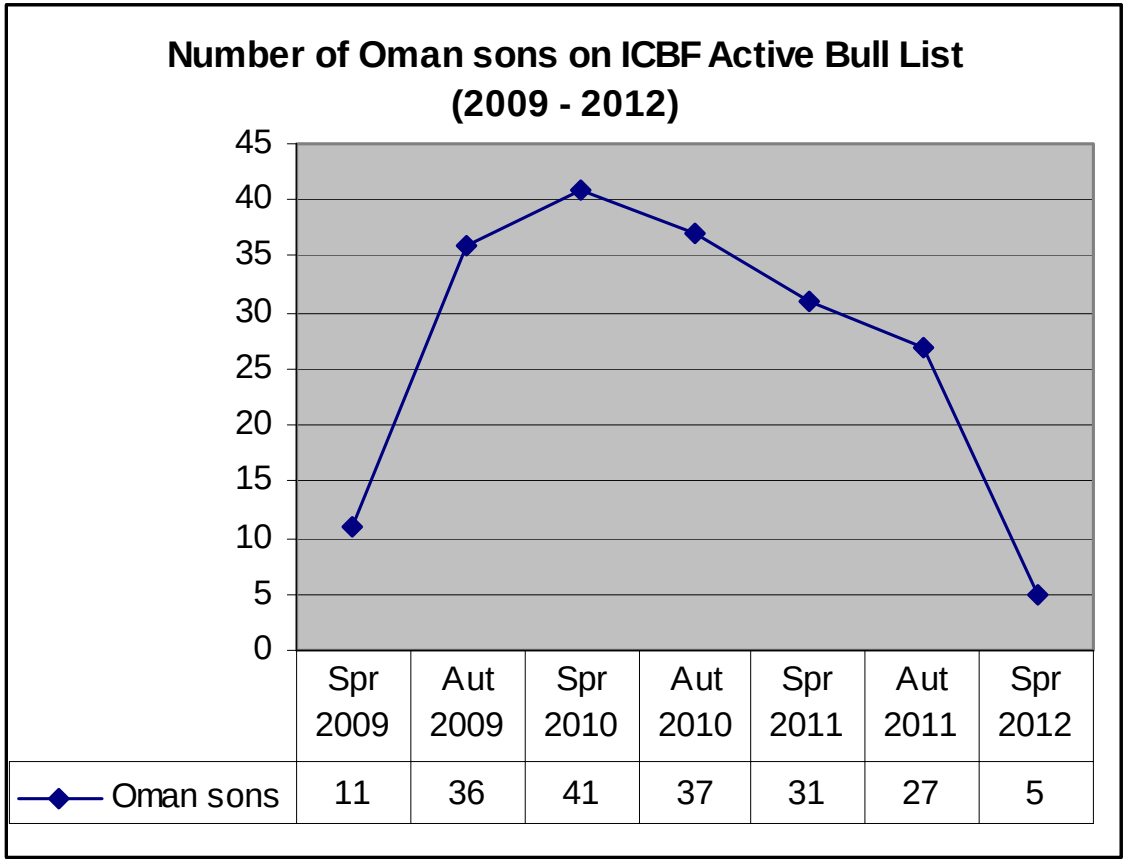
- 2001. 100 bulls & 100 daughters.
- 2003. High EBI bulls sourced in Ireland.
- 2005. Program launched. Focused on (i) number of bulls, (ii) EBI & (iii) efficiency.
- 2010. Impact of genomics. Balancing genetic gain vs. genetic diversity. Bull breeder group established.
- 2011. Genomics service. Role of females.
- 2012. Review underway…..

Bulls, EBI & efficiency.

Data	2005	2006	2007	2008	2009	2010	2011	2012	Target	Achieved
1. Bulls	33	53	55	83	74	54	48	53	100	56.6
2. EBI	€103	€123	€135	€137	€150	€167	€178	€213	€11.5	€13.8
3. Efficiency	7.3	7.6	7.2	7.4					7.0	7.4
- Straws	515	580	661	648	765	633	701	356		
- MR dtrs	71	76	92	88						

- Original targets for program; 100 bulls, €11.5 EBI gain & 7 straws/milk recording daughter.
  - Bulls progeny tested = Below target (disease & genomics)
  - EBI = Above target (Genomics).
  - Efficiency = On target (Sharing progeny test resources).
- Benefits of G€N€ IR€LAND program evident.

Genetic gain versus diversity – The Oman effect (part I).



	Spr 2009	Aut 2009	Spr 2010	Aut 2010	Spr 2011	Aut 2011	Spr 2012
Oman sons	11	36	41	37	31	27	5

- The Oman effect.
- Impact of genomics = faster gain & greater risk.
- Establishment of "bull breeder" group.

Promoting genetic diversity – bull mothers * sires of sons.

	2010	2011	2012
Targeted bull mothers	2,284	3,411	3,686
Targeted bull motheres where last known serve was to suggested sire.	293	360	377
Targeted bull mothers with male calf born to suggested sire.	105	138	
Targeted bull mothers with male calf born to suggested sire and calf genotyped.	93	94	
Targeted bull mothers with male calf born to suggested sire, calf genotyped and calf purchased by AI.	5		

- Disappointing response to “bull mother” program at farmer and AI company level. Why and how can we improve?

Why a National program is important. The Oman effect (Part II).

1. ICBF Active Bull List	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Number	75	75	75	75	75
- Oman	0	1	1	1	0
- Oman as a sire	0	12	41	31	5
- Oman as a grand sire	0	1	2	6	3
- % Oman genes	**0.0%**	**9.7%**	**29.3%**	**24.0%**	**4.3%**
2. Sire recorded females.	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Number	159,495	189,642	202,344	239,094	243,341
- Oman as sire	878	1073	706	549	187
- Oman as grand-sire	1,690	3,979	26,996	92,603	81,430
- % Oman genes	**0.5%**	**0.8%**	**3.5%**	**9.8%**	**8.4%**
3. IHFA registered males	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Number	4916	5082	4872	5728	4743
- Oman as a sire	216	231	141	79	14
- Oman as grand-sire	59	164	586	1651	1075
- % Oman genes	**2.5%**	**3.1%**	**4.5%**	**7.9%**	**5.8%**
4. G€N€ IR€LAND Ptest	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Number	63	48	25	34	41
- Oman as sire	5	8	2	2	0
- Oman as grand-sire	1	5	7	7	22
- % Oman genes	**4.4%**	**10.9%**	**11.0%**	**8.1%**	**13.4%**

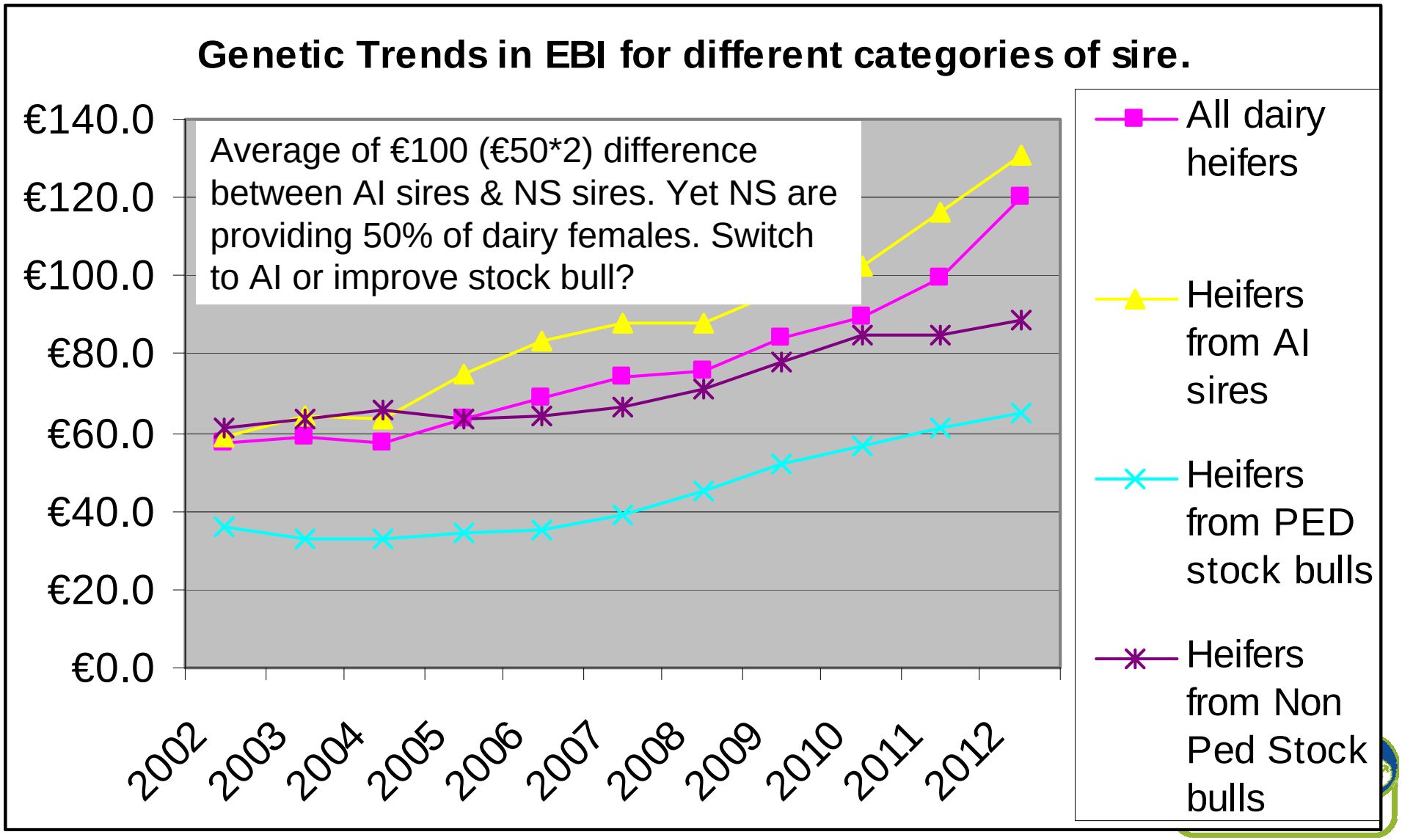
More rigorous analysis underway (Teagasc). Average relatedness of bull groups with; (i) National cow population and (ii) female young-stock.

Trends in dairy females.

Year	Dairy females	AI bred	NS Sire bred	No Sire
2008	250,923	129,689	29,806	91,428
2009	297,096	154,346	35,296	107,454
2010	305,526	158,673	43,671	103,182
2011	345,700	183,555	55,539	106,606
2012	365,822	188,135	55,206	122,481

- Big increase in dairy females. ~50% females by AI, ~15% by "known" NS sire & ~35% with no sire. Majority of these are by NS sires?
  - DIY herds include sire at time of registration.
  - Technician inseminations added after registration.
- Estimate 13.1k NS sires on 6.9k farms & growing.

AI versus Natural Service. Or combination of both?



Other areas of interest.

- What is the potential of sexed semen and how should it be integrated into National breeding program?
- Optimum design…..Bull breeder herds, 100k females, 5k males genotyped, 50 males for AI, bulls for NS…..?
- New parameters for managing breeding program; bulls, EBI, efficiency, diversity….at both AI and NS level?
- Others…

G€N€ IR€LAND Review 2012.

- Genetic diversity.
  - Oman legacy persists (at grand parent level). More than just Oman. Need to manage genetic diversity – long term genetic gain.
- Role of Natural Service sire.
  - ~ 50% of dairy females now by NS sire, yet largely ignored from breeding program work. How can we maximise AI and Natural Service offering?
- Sexed semen, optimum design, new parameters…..more?
- Review & report over next few months. Improvements for 2013 calving & breeding season.

IRISH CATTLE BREEDING FEDERATION

ICBF Dairy & Beef Industry Meetings.

25th July 2012.

National Development Plan
Transforming Ireland

Agenda 2 – Dairy & Beef (12.00-1.00).

- Calving performance – Thierry Pabiou, ICBF, Ross Evans, ICBF & Deidre Purfield, Teagasc.
- Stock bull functionality – Fiona Hely (Abacus Bio) & Andrew Cromie, ICBF.

IRISH CATTLE BREEDING FEDERATION

Calving evaluations

National Development Plan
Transforming Ireland

Calving evaluation: Current

- Genetic parameters 8 years old (2004)

- Calving ease

  Heritability
  - 23% (direct)
  - 3% (maternal)

  Genetic correlation
  -0.72

- Mortality
  - 1% (direct)

- Gestation

  Heritability
  - 39% (direct)
  - 4% (maternal)

Yearly profile in calving scores used in the genetic evaluation of calving ease

	Dairy herd calvings			Beef herd calvings		
Birth year	Records in ICBF database	% which qualify for evaluation	% of qualifying records which are pedigree	Records in ICBF database	% which qualify for evaluation	% of qualifying records which are pedigree
2003	251,045	76	23	6,625	63	17
2004	299,872	76	21	58,451	66	34
2005	314,488	78	19	77,096	67	30
2006	359,347	80	16	107,053	69	22
2007	355,810	80	17	118,777	69	20
2008	457,941	82	14	911,189	81	3
2009	464,605	83	15	769,295	79	3
2010	475,409	83	15	723,401	80	3
2011	523,390	83	12	653,591	78	3

Calving evaluation: edits

- Edits
  - Parities 1 to 10
  - Twins are excluded
  - Known abortions are excluded
  - No editing on scoring patterns in herds

- Correction factors
  - adjusted for herd-year-season, dam parity, age of dam, sex, heterosis of dam and calf
  - Repeatability effect of dam

Calving evaluation: Problems

- Different usage for Bulls:
  - Heifer v Mature cows
  - Dairy cows v Beef cows
  - Commercial cows v pedigree cows
- Lack of variation in herds
  - Genuinely no incidence of calving difficulty
- Under reporting of calving difficulty
  - Inaccurate genetic merit for New bloodlines
- Lack of predictor traits
  - Birth weight
  - Weaning weight
  - Carcass weight
  - Integration of foreign data (currently being done post evaluation)

2011 Calving score recording patterns

Spread in scores	Commercial Beef herds			Pedigree beef herds		
	Herds	% of herds	Animals	Herds	% of herds	Animals
1 - - -	19,271	46.6%	210,243	4,293	61.4%	15,110
1 2 - -	11,252	27.2%	190,646	1,115	15.9%	8,384
1 2 3 -	3,891	9.4%	88,166	168	2.4%	2,058
- 2 - -	794	1.9%	3,731	563	8.0%	1,012
1 2 - 4	1,827	4.4%	39,690	129	1.8%	1,589
1 2 3 4	1,507	3.6%	49,289	58	0.8%	954
1 - 3 -	873	2.1%	12,398	154	2.2%	1,043
1 - - 4	989	2.4%	15,210	173	2.5%	1,261
- 2 3 -	402	1.0%	5,309	68	1.0%	283
- - 3 -	155	0.4%	638	102	1.5%	144
- - - 4	82	0.2%	268	103	1.5%	143
1 - 3 4	169	0.4%	3,273	18	0.3%	140
- 2 3 4	94	0.2%	1,693	13	0.2%	114
- 2 - 4	45	0.1%	401	28	0.4%	87
- - 3 4	28	0.1%	266	12	0.2%	34

Calving evaluation: Research

- Re-estimation of genetic parameters
- Using a reduced dataset where herds had variation in calving difficulty score and also some level of mortality
  - Currently running, Initial estimates:
  - Calving ease
    - heritability: 10-12% (direct) & 2-3% (maternal)
    - Genetic correlation: -0.1 to -0.2
  - Mortality
    - Day 0 to day 4: heritability = 5%
    - Day 5 to day 28: heritability = 6%
    - Genetic correlation: +0.05

Calving evaluation: Research

- Next phase will look at Predictor traits (heritability)

	heritability	genetic correlation
• Birth weight	0.45	???
• Weaning weight	0.35	0.36
• Calf quality score	0.33	0.29
• Muscle score	0.39	???
• Carcass weight	0.45	0.29
• Carcass conformation	0.40	0.19

Calving evaluation: Research

Literature estimates of genetic correlations with calving score

Country	Breed	Predictor trait	heritability	genetic correlation
US	Multi breed	Birth weight	0.81	0.81
France	Aubrac		0.39	0.30
	Salers		0.47	0.04
	Charolais		0.35	0.66
	Blonde D'A		0.39	0.72
	Limousine		0.39	0.40
	Parthenaise		0.34	0.74
Sweden	Hereford		0.51	0.62
	Charolais		0.51	0.72
Czech Rep	Mulit breed		0.29	0.30
Italy	Piemontese	ADG	0.59	0.43
US	Multi breed	200 d wt		0.41
		liveweight		0.36
	Piemontese	Thigh muscularity	0.44	0.21
		Loin width	0.14	0.18
Denmark	Holstein	Birth size (scale of 1 to 4)	0.23	0.77
	Jersey		0.20	0.75
	Red Danish		0.11	0.67

Calving evaluation: Research

Separate First parity vs Later option also examined

- Genetic correlation of 0.72
- Problems with implementation
- Small contemporary groups especially beef herds
- What trait is published?
- Bulls used exclusively on heifers vs cows
- Examining option of treating heifers in herds by allocating them to different contemporary group

Calving evaluation: Research

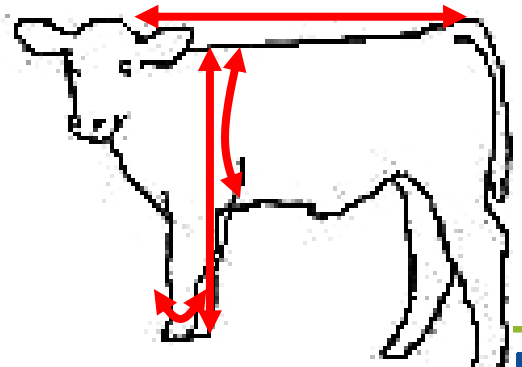
- Integration of foreign ebvs
  - Currently foreign proofs are integrated post evaluation
    - INTERBULL (dairy)
    - Breed x country (beef)
  - Integrate proofs directly into the evaluation similar to beef
  - EBV run including all qualifying data
  - Reliabilities
  - Release test proofs October/November

Birth weight predictions

Predicting birth weights from linear measurements taken at calving

Data

- Birth weights (BW) and linear measurements recorded on farm
  - Collected Jan to July 2012
  - 871 usable records to date
  - Birth weight (kg)
  - Linear measures (cm) : chest circumference, canon bone circumference, height at shoulder, length of back



Descriptive stats

Breed make-up		
Breed	N	% Xbred
LM	253	71%
CH	194	84%
BB	89	81%
AA	84	29%
SI	79	67%
HE	76	28%
PT	37	78%
BA	16	100%
SA	16	0%
FR	15	87%
HO	7	86%
Other	5	100%

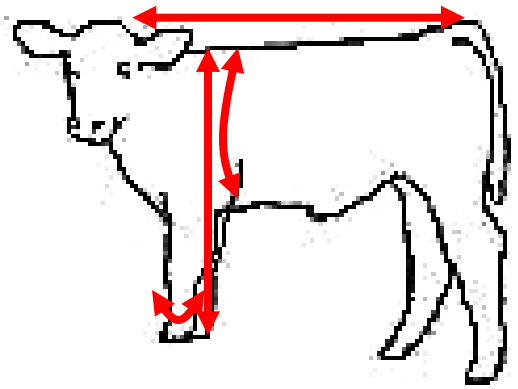
Correlation BW / linears per (main) breed type					
	N	canon	chest	Len. back	shoulder
LMcross	192	0.56	0.84	0.41	0.64
CHcross	164	0.40	0.62	0.24	0.64
BBcross	72	0.43	0.77	0.18	0.70
LMpure	61	0.17	0.66	-0.06	0.58
SIcross	59	0.52	0.67	0.25	0.72
AApure	57	0.83	0.86	0.58	0.80
HEpure	55	0.66	0.83	0.67	0.80

Calving scores	Count	%	Mean BW (kg)
1	665	76	44
2	120	14	48
3	32	4	55
4	16	2	49
Missing	38	4	45

Correlations linears / BW

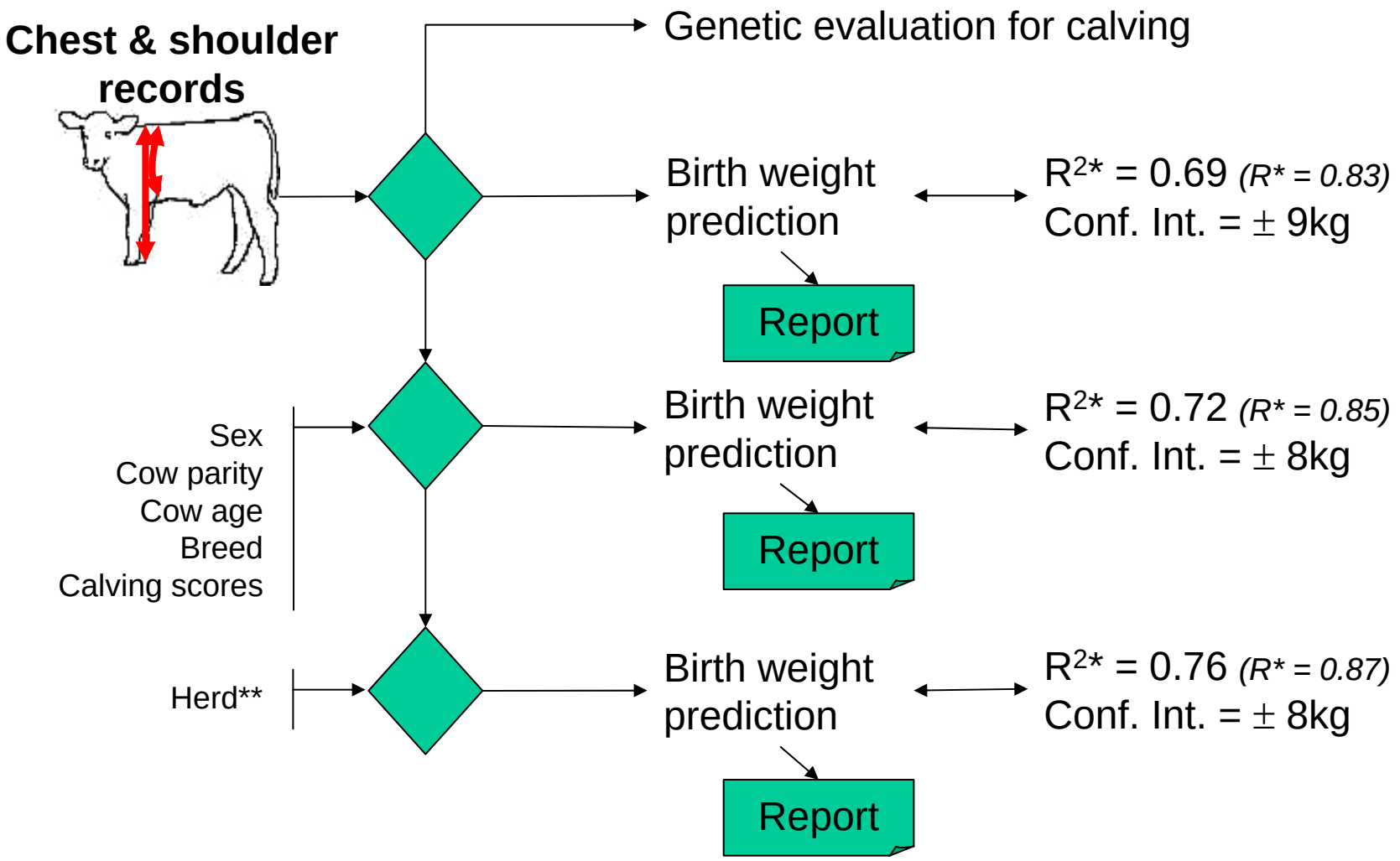
- Collecting 4 measurements
  - Probably too much
- Minimum recordings 2 / 4 measurements
  - Chest circumference
  - Height at shoulder

Linears	R^{2*}	Confidence interval
Chest	0.64	± 9kg
Shoulder	0.46	± 11kg
Canon	0.24	± 14kg
Length of back	0.15	± 14kg



*In validation dataset

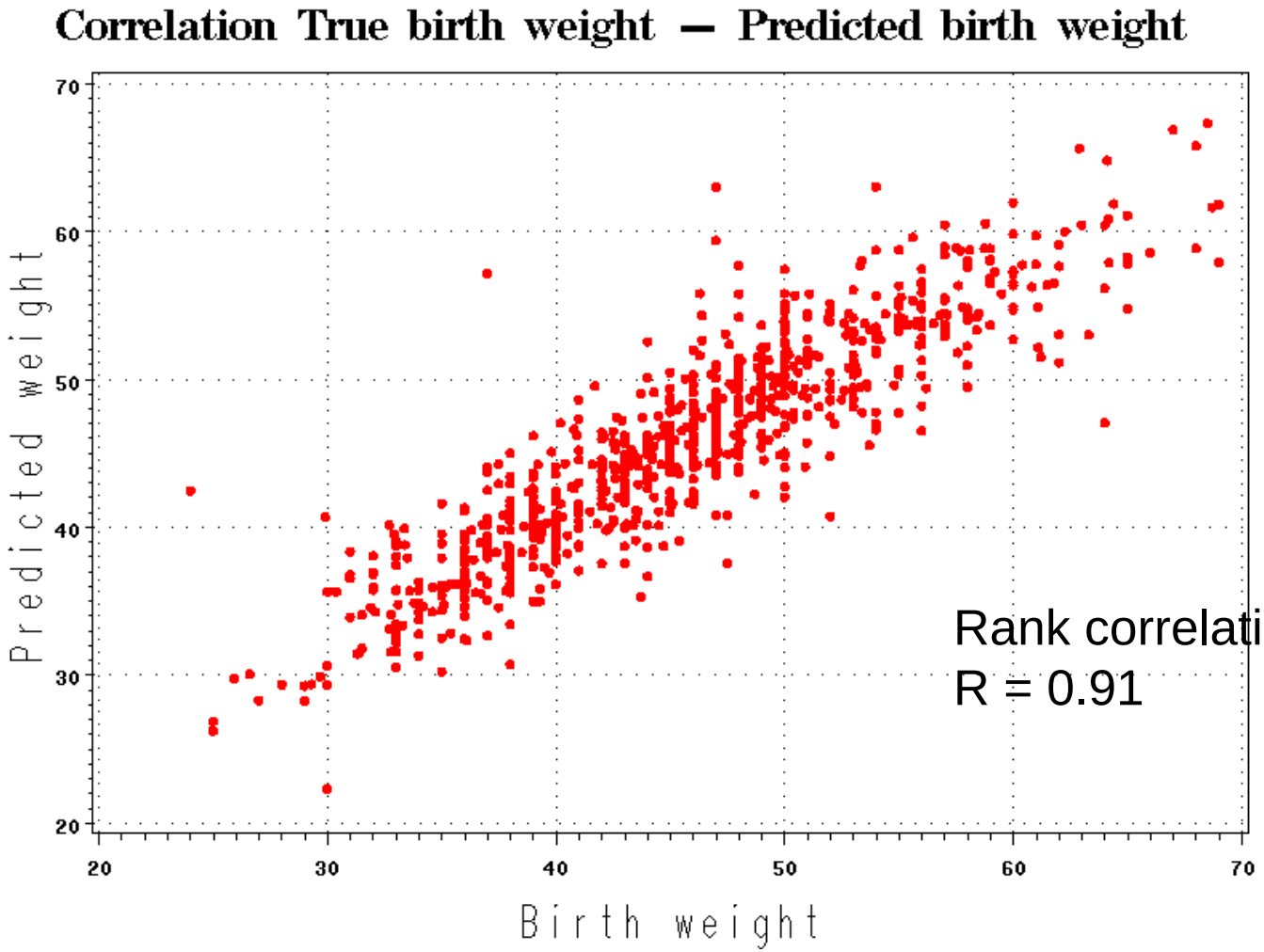
Predicting birth weights



*** need some true BW to estimate herd solution*

**In validation dataset*

Rank correlation



Genetics of perinatal mortality and dystocia

Deirdre Purfield

Teagasc Moorepark

Main Focus

- **Dystocia**: prevalence of 6.8% in pasture based HF in Ireland
- **Perinatal Mortality**: prevalence of ~4.29%

- **Perinatal Mortality without dystocia**
  - ~50% of calf mortalities experience no calving difficulty

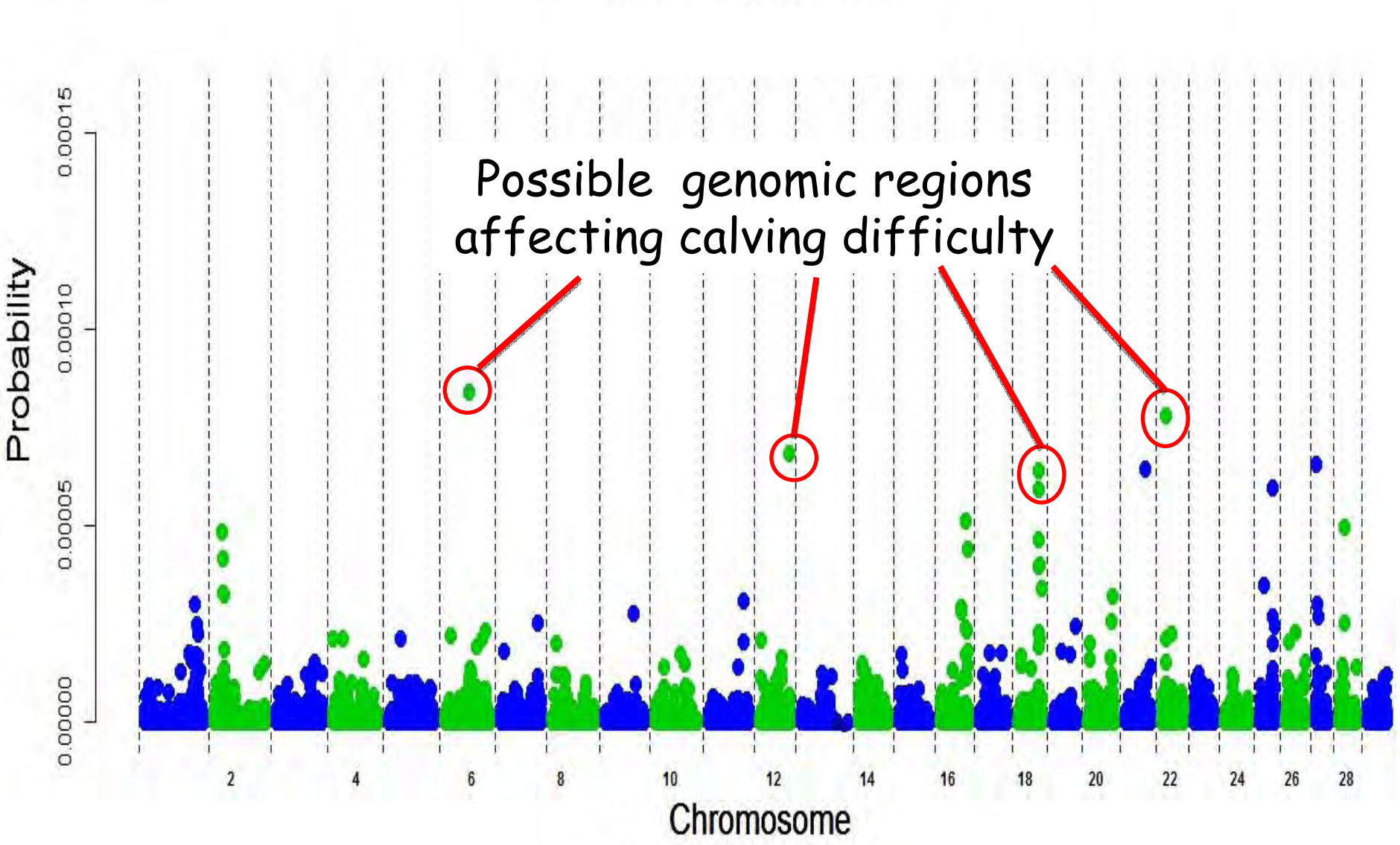
Objective

- Re-estimate genetic parameters for calving traits
  - Redefine model used
  - First v Later parities
  - Pedigree v Commercial
- Correlation of calving difficulty with other traits; **weight, linear score, gestation length, mortality**
- Estimation of EBVs
- Identify DNA regions associated with calving traits

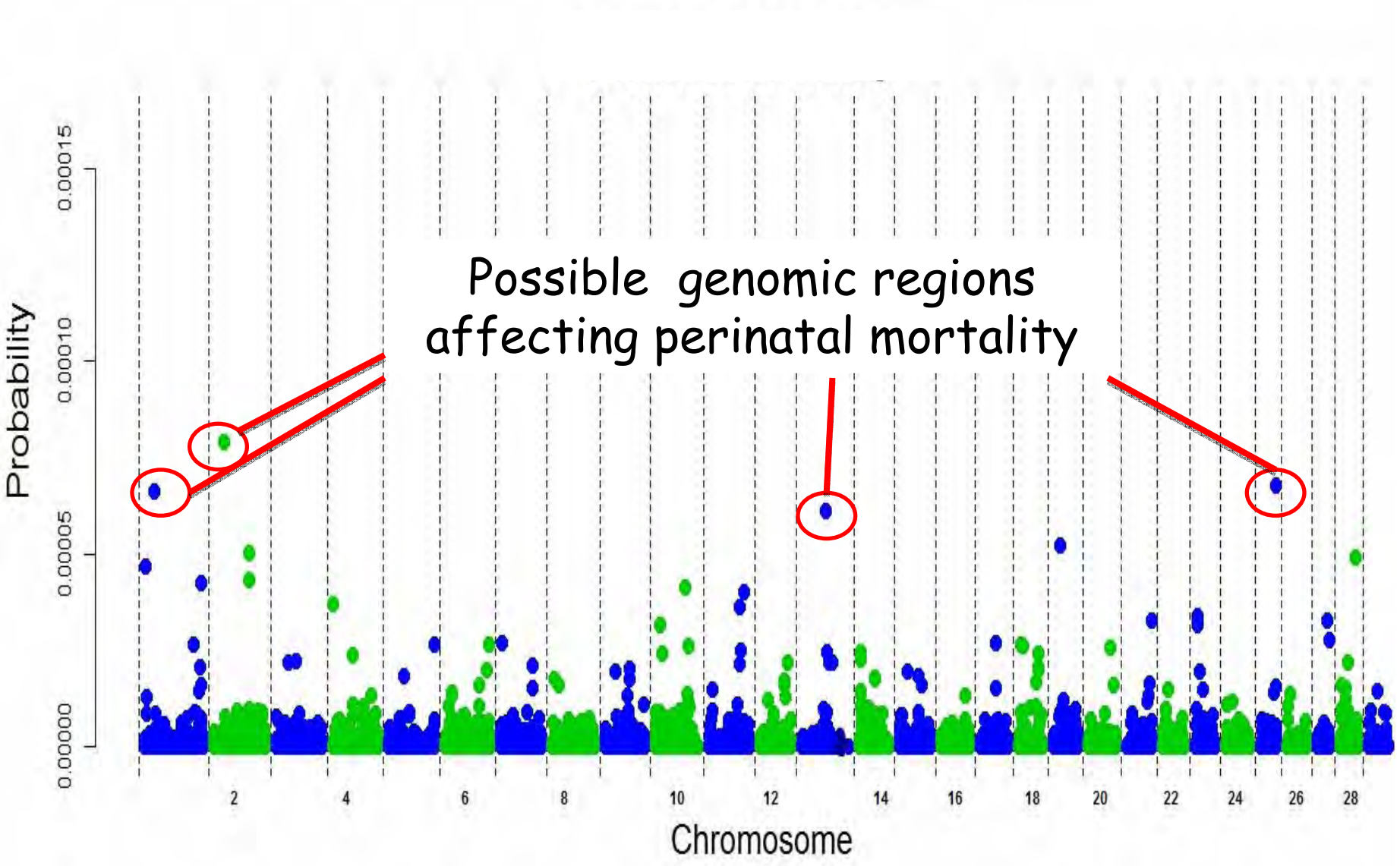
Genomic Associations

- Identify regions of the genome associated with calving traits
- Over 5700 dairy animals genotyped on Bovine SNP50 chip
- 3124 beef animals HD genotyped

Calving Difficulty



Perinatal Mortality



Conclusion

- Better calving evaluations
  - Account for selection bias/misrecording
- Understanding the genetic architecture of calving traits

ABACUSBIO LIMITED

STOCK BULL FUNCTIONALITY ANALYSIS

Fiona Hely, Peter Amer, Tim Byrne, Andrew Cromie, Ross Evans, John McCarthy, Francis Kearney

Analysis of data

ABACUSBIO LIMITED

- Need to define what a “stock bull” is
- 16GB of data needs to be filtered and merged to find these stock bulls and their movements and progeny during their service life
- Determine how many progeny each stock bull has in each herd year of their service life

Stock bull categories

ABACUSBIO LIMITED

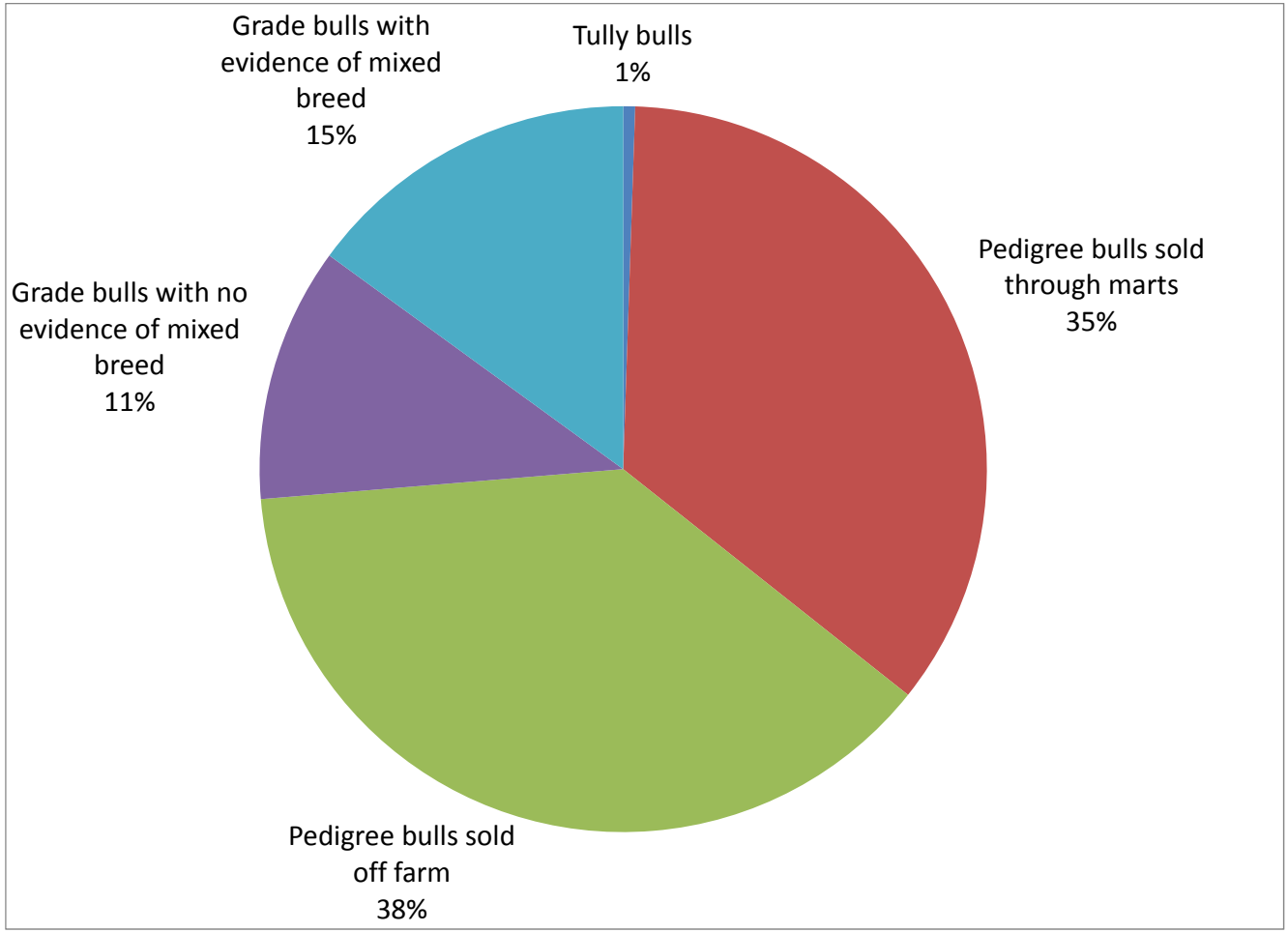
1. Stock bull that has passed through the Tully Performance Centre
2. Full pedigree status stock bull that has been sold in a mart
3. Full pedigree status stock bull that has not been sold in a mart
4. Grade bull with no evidence of mixed breed background
5. Grade bull with evidence of mixed breed background

Number of bulls by category

ABACUSBIO LIMITED

	Bull category	n
1	Tully performance centre bulls	28
2	Full pedigree status bulls sold through mart	1636
3	Full pedigree status bulls not sold through mart	1858
4	Grade bull with no evidence of mixed breed background	970
5	Grade bull with evidence of mixed breed background	2319

Stock bull progeny by bull categories



Measures of stock bull performance

ABACUSBIO LIMITED

- Comparisons of service length can only be made between stock bulls that are already dead otherwise stock bulls still in service will be penalized.
- If the total number of progeny sired by a stock bull is used as a performance measure it must be corrected for herd size in order to fairly compare stock bulls used in smaller herds with those used in larger herds.

Progeny per bull

ABACUSBIO LIMITED

Bull category	Progeny sired between 2 and 3 years old*	Progeny sired by 4 years old
Tully bulls	2.29	12.98
Full pedigree bulls sold through mart	7.49	19.76
Full pedigree bulls sold direct off farm	7.55	19.07
Grade bull with no evidence of mixed breed background	5.31	14.95
Grade bull with evidence of mixed breed background	3.88	12.42

The average number of progeny for each category is adjusted for the number of cows
available to the stock bull , which accounts for stock bulls in smaller herds with less opportunity.

*includes zeros for bulls who sired no progeny between the age of 2 and 3 years old.

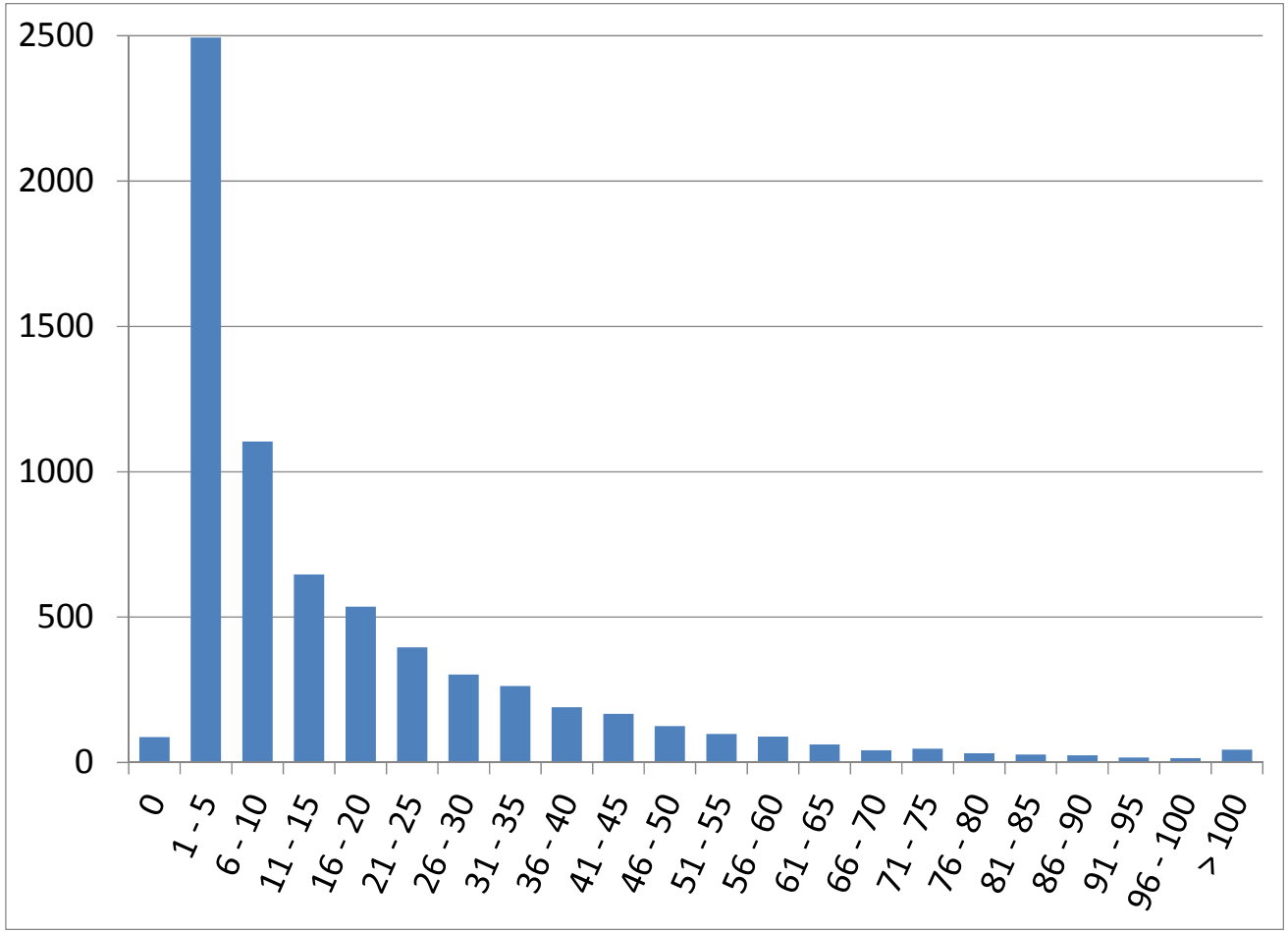
Index comparisons

ABACUSBIO LIMITED

Index	Tully bulls	Pedigree mart bulls	Pedigree direct bulls	Grade bulls no mixed breed	Grade bulls mixed breed
Calving sub index	-11.06	-11.49	-11.17	-8.68	-4.77
Slaughter sub index	88.70	72.93	73.10	52.51	40.28
Maternal cow sub index	-19.51	-42.90	-41.31	-4.10	42.21
Daughter fertility sub index	22.97	7.64	7.07	17.49	27.51
Daughter milk sub index	4.98	-3.37	-1.03	15.28	43.26
Overall suckler beef value	97.07	70.54	70.93	57.71	59.45
New suckler cow beef value	355.93	222.91	228.28	232.35	303.79

Total number of progeny per stock bull

ABACUSBIO LIMITED



Total number of progeny per stock bull

ABACUSBIO LIMITED

Total number of progeny	Number of stock bulls
0	87
1 - 5	2494
6 - 10	1104
11 - 15	647
16 - 20	536
21 - 25	396
26 - 30	303
31 - 35	263
36 - 40	190
41 - 45	168
46 - 50	125
51 - 55	98
56 - 60	89
61 - 65	62
66 - 70	42
71 - 75	47
76 - 80	32
81 - 85	27
86 - 90	25
91 - 95	17
96 - 100	15
> 100	44

Average number of progeny per bull by breed

ABACUSBIO LIMITED

Breed	Number of bulls	Average number of progeny sired between 2 and 3 years of age*	Average number of progeny sired by 4 years of age*	Service Length
AA	672	4.75	14.39	228.14
AU	43	6.30	16.93	211.49
BA	63	7.13	16.38	177.29
BB	284	3.56	10.28	240.73
CH	2553	6.98	18.51	203.85
HE	249	5.34	14.12	228.02
LM	1919	5.75	15.75	218.88
SA	91	6.54	19.37	185.73
SH	210	4.08	12.76	249.54
SI	654	5.78	17.03	198.90

*These are raw means that have not been adjusted for herd size

Next steps

ABACUSBIO LIMITED

- Stock bull performance in dairy vs beef herds
- Experimenting with measures of functionality
- Test heritability of functionality traits
- Compare breeds

Stock Bull Survey

- Survey farmer opinion re: their stock bull (current & past) for key traits.
  - Lameness/locomotion, calving difficulty, temperament (bull & progeny), libido, male fertility, calf quality, overall satisfaction.
- Include additional reasons for death/culling (if bull is dead), e.g., poor progeny, old age, health/disease, injury…..
- Survey form being developed. Posted to users of ICBF HerdPlus (15k beef & dairy herds).
- Integration with “database” data.

IRISH CATTLE BREEDING FEDERATION

ICBF Dairy & Beef Industry Meetings.

25th July 2012.

National Development Plan
Transforming Ireland

Agenda 3 –Beef (2.00-3.30)

- ICBF weight recording service.
  - Weight predictions – Thierry Pabiou, ICBF.
  - Operation of service – Pat Donnellan, ICBF.
- €uro-Star implementation.
  - Presentation of material – Andrew Cromie, ICBF.
  - Supporting research – Noirin McHugh, Teagasc.
  - Roll-out plan – Pearse Kelly, Teagasc & Pat Donnellan.
- Teagasc Suckler Beef Herd – Noirin McHugh, Teagasc.
- Genomics – Donagh Berry, Teagasc.
- AOB.

IRISH CATTLE BREEDING FEDERATION

Weight Predictions.

Thierry Pabiou

National Development Plan
Transforming Ireland

2 types of predictions

1. Live weight
   - Using previously recorded weight(s)

2. Slaughter (live) weight
   - Using slaughter data

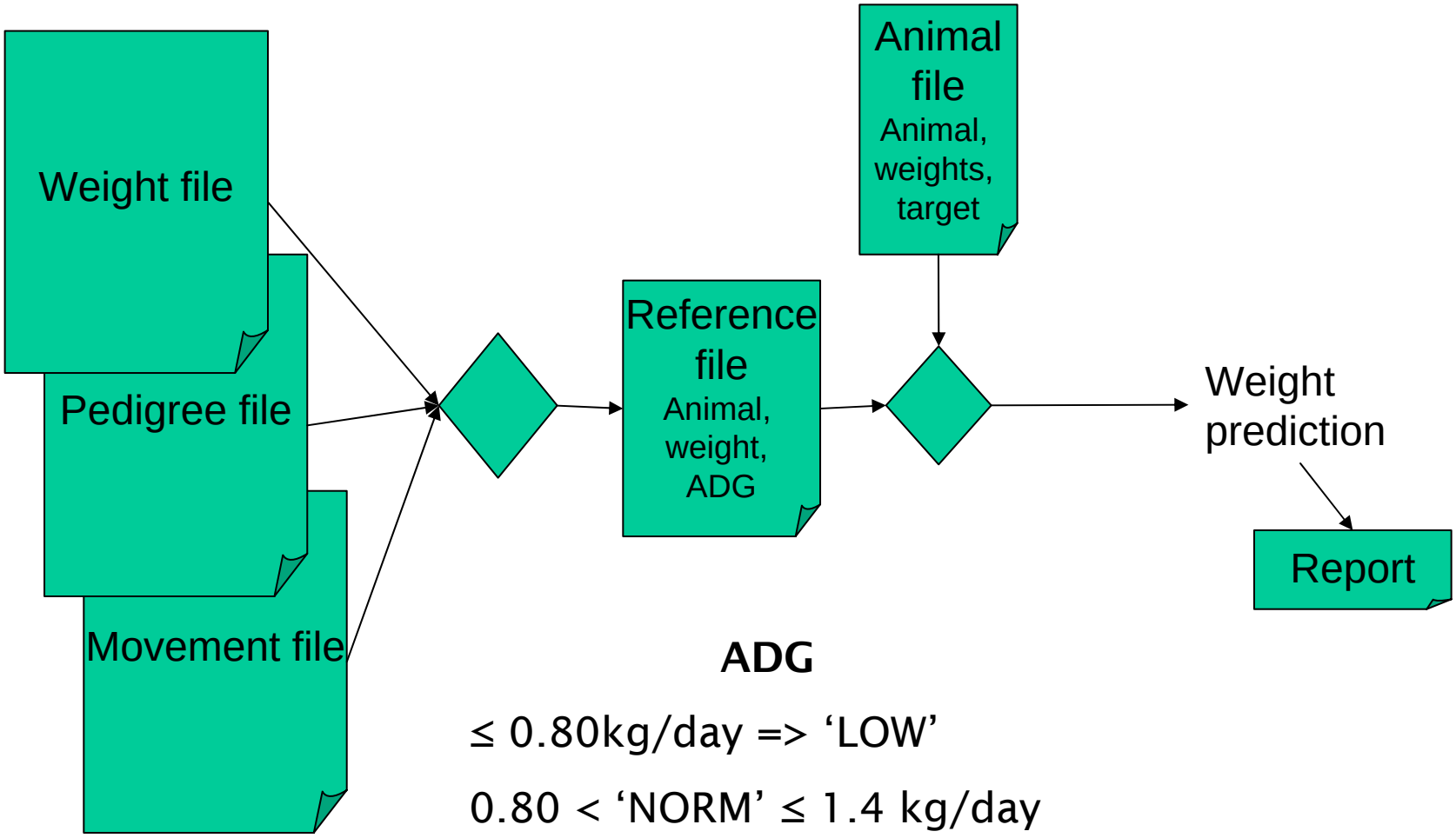
1. Live weight predictions

Predicting live weights to a specific age

Method

- Using a reference population to model growth curve from birth to 900days
  - Animals with at least 3 validated weighs
- A first version currently running
  - Using breed type, gender, herd, and animal
- New version
  - Will also introduce a curve for animal ADG

Method



ADG

≤ 0.80kg/day => 'LOW'

0.80 < 'NORM' ≤ 1.4 kg/day

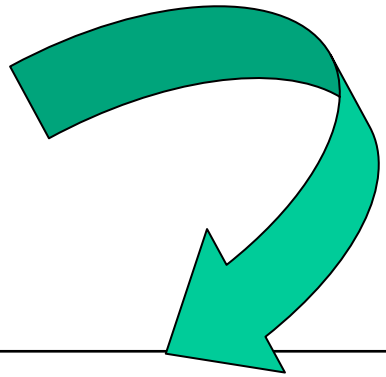
> 1.4 kg/day => 'HIGH'

Accuracy

- Using a validation dataset

R^2 in Current model

		Last weight taken before…			
		300d	400d	500d	600d
Nb weights	1	0.59	0.69	0.78	0.88
	2	0.71	0.75	0.70	0.87



R^2 in ADG model

		Last weight taken before…			
		300d	400d	500d	600d
Nb weights	1	0.73	0.78	0.81	0.89
	2	0.81	0.84	0.83	0.87

Nb of animal in validation dataset

	300d	400d	500d	600d
1	2455	1751	1496	1977
2	169	426	1606	696

Conclusion

- Live weight prediction
  - Running
  - Need to upgrade model with ADG
  - ADG model can be more dynamic than current model

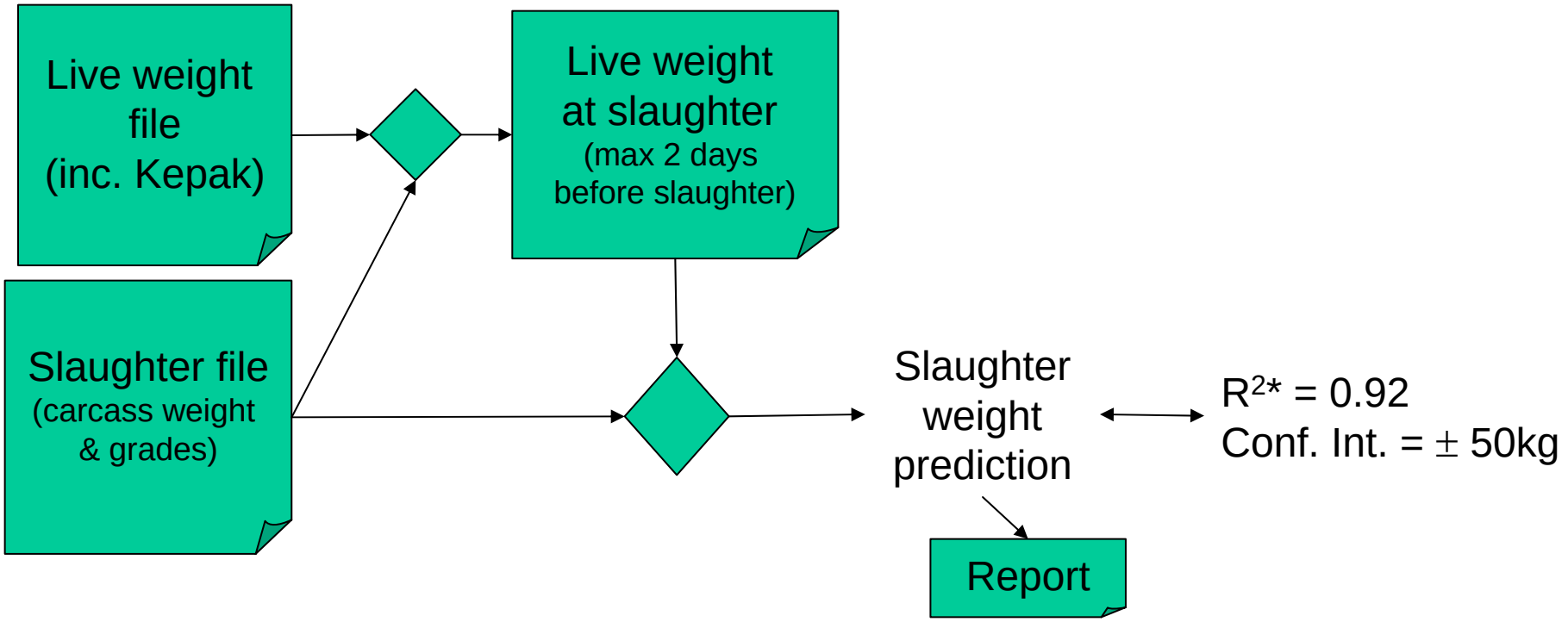
2. Slaughter (live) weight predictions

Predicting live weights at slaughter

Method

- Predicted live weight at slaughter from slaughter data
  - CCW CCON CFAT
  - 1 equation per carcass type

Predictions



*In validation dataset

ICBF.com

Conclusion

- Slaughter (live) weight prediction
  - Running

IRISH CATTLE BREEDING FEDERATION

ICBF Weight Recording Service.

Pat Donnellan

National Development Plan
Transforming Ireland

The Process

ID3000

Technician weighs animals and data transfers to Handheld via bluetooth

Receipt for farmer on 3" printer

Predictive Weight/ADG Data sent back via mobile phone system

Weight Data sent to ICBF database via mobile phone system

ICBF Website

Farmer upload/ download information

ICBF.com Database

Process

- Farmer signs up for Weighing Service
- Allocated to a technician depending on area
- Farmer/Technician provided with Optimum Weighing dates
- Technician weighs animals
- On day of weighing farmer is provided with print out showing predicted weights and ADG
- Online reports are available on HerdPlus website

The Outputs

- ✓ 3” till receipt printed on farm – with weight/ADG/forecast weight
- ✓ On-line reports available
- ✓ Printed report

3” Receipt

On-Farm Weighing Printout

[redacted]

Print Date: 17-May-2012 16:05:34
Call id: 6222120515154418 4

Group: 1
Desc: Calves Prediction: 01-Sep-12

Tag	Sex	Age Mts	Wt. Kgs	ADG Birth	Pred Kgs	No. *
90208	M	2	111	0.87	225	2
70206	M	4	156	1.00	258	2
80207	M	3	170	1.33	275	2
20201	M	6	190	0.74	281	2
10200	F	7	266	1.07	332	2
30202	F	6	269	1.22	337	2
60205	M	6	262	1.21	348	2
40203	M	6	287	1.30	368	2
60196	F	8	310	1.11	373	2
70197	F	8	333	1.22	394	2
90199	M	7	321	1.28	400	2
80198	M	7	325	1.27	404	2
Avg:		5	250	1.14	333	2

Group: 2
Desc: Cows Prediction: 01-Sep-12

Tag	Sex	Age Mts	Wt. Kgs	ADG Birth	Pred Kgs	No. *
20176	F	32	656	0.64	NA	7
61666	F	32	544	0.51	NA	3
70156	F	52	756	0.45	NA	4

ICBF.com

Post-Weighing Report

Weight Recording Summary

HerdPlus
Profit through Science
LoCall 1850 600 900

[redacted]
ATHY CO KILDARE

Herd Owner: [redacted]
Herd No:
Print Date: 09/05/2012
Weigh Date: 09/05/2012

1(1)

Animal Performance

Groups	No. of Animals	Avg. Age & Weight	A.D.G Birth	No. Matched from last Weighing*	A.D.G from last Weight	Days since Last Weight
HEIFERS	15	13.38mts /426Kgs	.93			
ALL	15	13.38mts /426Kgs	.93			

Dam's Progeny Performance

Groups	1st Calvers	2nd Calvers	3rd Calvers	4th Calvers	5th Calvers	6th Calvers +
	NBR/Age Weight / A.D.G	NBR/Age Weight / A.D.G	NBR/Age Weight / A.D.G	NBR/Age Weight / A.D.G	NBR/Age Weight / A.D.G	NBR/Age Weight / A.D.G
ALL						
HEIFERS		1/ 13.39mts/ 417Kgs/ .91		5/ 13.41mts/ 436Kgs/ .96	1/ 13.52mts/ 427Kgs/ .93	1/ 13.58mts/ 462Kgs/ 1.01

Sire's Progeny Performance

Sires		No. of Progeny	Avg. Age & Weight	A.D.G - Birth	No. Matched from last Weighing	A.D.G from last Weight	Days since last Weight
Tag Number	Breed						
[redacted]40 68	CH	31	11.97mts /467Kgs	1.16			
[redacted]24 92	LM	1	14.74mts /465Kgs	.94			
[redacted]49 79	LM	9	11.57mts /424Kgs	1.08			
[redacted]06 96	LM	2	12.62mts /437Kgs	1.03	2	.52	139

ICBF.com

Timelines

June;

✓Further testing on split platform.

✓Finish new updates on handheld software.

✓Test and finalise the printed + online reports.

✓Weight Prediction Testing.

✓Hire & Train technicians

July – Launch Service

19 Technicians hired and in training

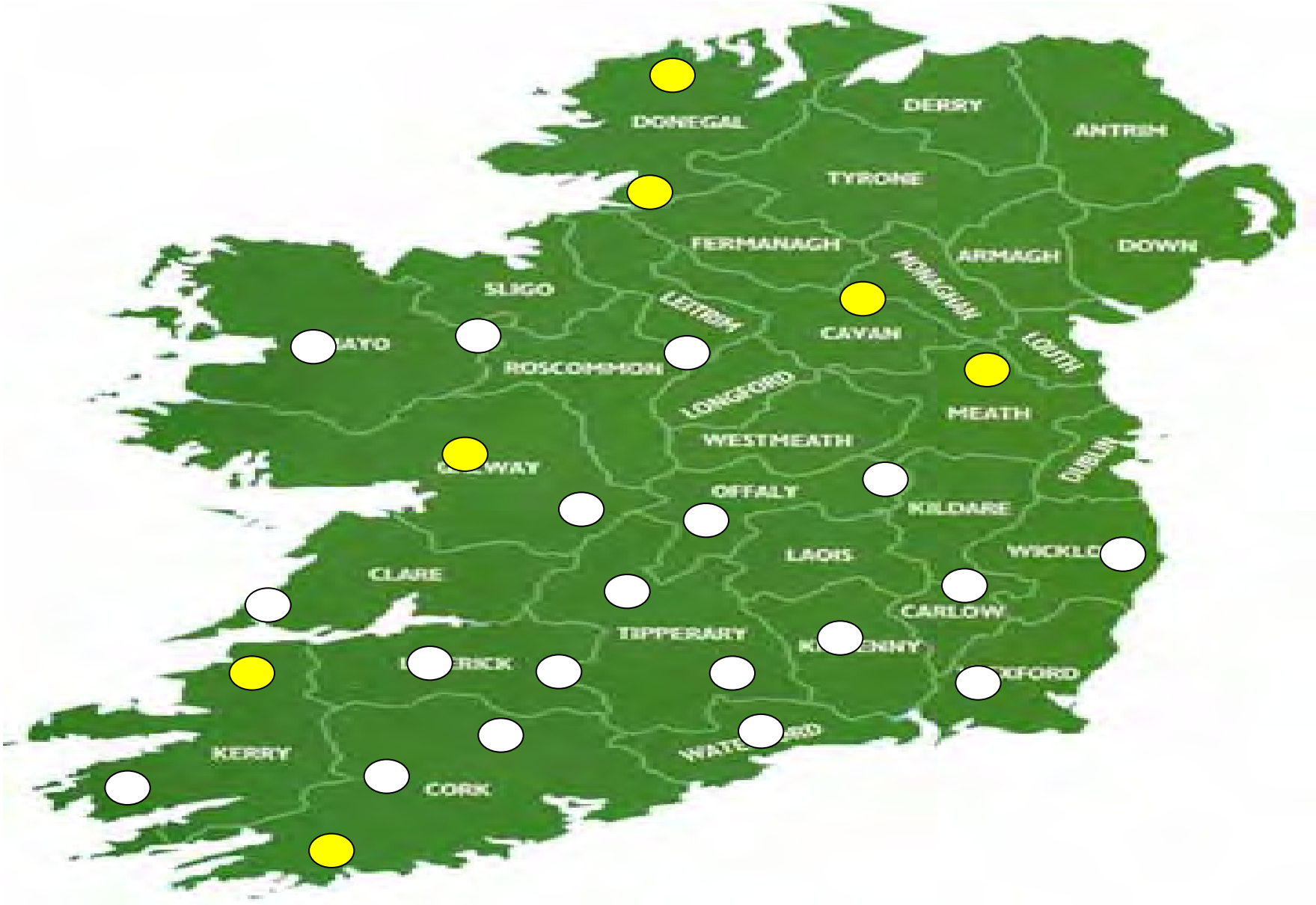
Further 7 in progress

Aug – Sep - scale up to Nationwide coverage

Cost of service.

- €60 for first 15 animals (includes call-out charge).
  - €2.50/animal between 15-30.
  - €1.25/animal after 30.
- Direct debit (or cheque) made payable to ICBF.
- Weight recorder paid on basis of recorded weights in database.
- Small rental fee charged for equipment.

National Network



ICBF launches national weighing service to monitor performance

DARREN CARTY
LIVESTOCK REPORTER

Regular weight recording is central to monitoring animal performance and has an important role to play in efficient livestock production.

Weighing identifies the top performers in your herd but, equally important, it also identifies poor performing animals. This information is invaluable in selecting the animals or breed lines that are returning the most to your system.

It can also help identify underlying health problems causing reduced performance or highlight inadequacies in grassland management or feeding regimes.

ICBF has recently launched a national weight recording service. The service will be focused on providing farmers with the most up-to date information to make informed breeding decisions while also evaluating current animal performance. The new service also brings current evaluations one step further by predicting the future performance of animals.

THE BENEFITS

The weight recording service will have benefits for farmers and livestock breeding programmes. The benefits to farmers are summarised above.

The benefit of an increased flow of weight recording data to the industry and future breeding programmes is very significant.

This data will strengthen Ireland's database and add to the accuracy and strength of genetic evaluations. This will, in turn, allow for faster identification of animals and breed lines that deliver superior performance.

ICBF says that the service may also be widened out at a later date to give technical advice on aspects such as breeding and performance improvement.

The weights will be recorded by technicians on handheld devices.

These devices are linked to the ICBF database allowing the weights to be uploaded automatically. This means manual weights will not have to be entered online or submitted by post to ICBF.

The weight recording service is also BTAP approved and therefore the task; provide on farm weights to ICBF. BTAP farmers must weigh calves at least once between 150 and 250 days of age while non-suckler farmers must weigh cattle within 30 days of arrival on the farm or as early as possible in the finishing period.

NATIONAL ROLLOUT

The weight recording service will be rolled out in a staggered procedure across July, August and September. Technicians are being contracted nationwide and these will be given designated areas to cover. Farmers interested in availing of the service can sign up to ICBF by calling 1850 600 900.

Signing up does not tie farmers into a contract. It just records their interest in getting cattle weighed. They will then be contacted by a weighing technician to arrange an appointment.

Table 1: Weight predictor evaluation example

01/07/2012	+ 30 days	+ 60 days
350kg	392kg	431kg

Regular weighing identifies the best performing animals and allows breeding decisions to be made with greater accuracy.

THE PROCEDURE

ICBF reports that the weighing procedure is simple. The scales and reading equipment will be provided by the technician.

The farmer requires a crush in working order that has a sound and level floor and meets the dimensions of holding the scale 2,210mm in length by 645mm in width or seven feet three inches by two feet, 1.5 inches.

The scale is placed at the top of the crush and cattle are weighed as they pass over the scale. ICBF says that farmers need to be aware that animals will be raised four to five inches off the ground and to check if this will be an issue in low-sided chutes.

Once the weighing has been completed, a printout of all weights recorded will be given to the farmer. This is similar to dockets received via handheld devices from AI technicians.

HerdPlus members will receive a HerdPlus service report (similar to the Suckler Cow report, Eurostar report, etc) which will be generated in the ICBF database following weighing. This includes the new 'Weight Predictor', which is explained in detail below.

Farmers can access this through their HerdPlus login or a hard copy can also be requested by post. ICBF says that this report should be available within a week after weighing.

NEW WEIGHT PREDICTOR

The weight predictor is an additional component of the new weight recording report. The predictor takes the current weight of the animal and includes factors such as breed, sex of animal, historic herd performance (if recorded) and the genetic value of the individual animal to deliver future weight predictions. The weight predictions can be given for set intervals of 30 or 60 days later, for example. An example of this is shown below.

The weight predictor can be used to predict the weight at housing or sale date for example but it can also be used to set definite weight targets within a certain time frame.

If cattle are falling below weight predictions, it should ring alarm bells that management is lacking or, alternatively, that there may be underlying health issues/feed problems, etc. If weight gain is above this level, then cattle are at the very least performing at an adequate level.

COST OF WEIGHING SERVICE

The cost of the service is €60 for up to 15 animals. This is the call-out fee and applies no matter number of animals are being weighed between one and 15 animals.

The next group of animals weighing between 16 and 30 head will be charged at €2.50 per head.

From 31 animals upwards, the cost of each additional weighing is €1.25 per animal. Examples of different pricing models or scenarios are listed below.

SCENARIO 1

- Farmer with two animals to be weighed: €60.
- €60 is base price (includes weighing anything from one to 15 animals).

SCENARIO 2

- Farmer with 26 animals to be weighed: €87.50.
- €60 callout covers first 15 and 11 animals extra at €2.50 per head (€27.50) = €87.50.

SCENARIO 3

- Farmer with 47 animals to be weighed = €118.75.
- €60 callout covers first 15 head + 15 animals (up to 30) @ €2.50 (€37.50) + 17 animals (over 30) @ €1.25 (€21.25) = €118.75.

TECHNICIANS SOUGHT

ICBF is still looking for technicians to operate the weighing service. Interested applicants should contact 1850 600 900 or email query@icbf.com for further information.

Contribution of animal recording to beef farm profitability

Animal records, from birth to slaughter, enter the ICBF database on a daily basis from farmers, herd-books, AI companies, meat processors, Department of Agriculture etc (an integrated database, M. Lynch, http://www.icar.org/cork_2012/). Beef farms can be clearly partitioned into four main groups according to the level of data recording they're engaged in:

- Farms solely doing compulsory animal recording: calf registration.
- Farms engaged in the Suckler Cow Welfare Scheme (SCWS): recording of calving ease, sire parentage, calf quality and calf docility.
- Farms engaged in SCWS and ICBF HerdPlus, which gives farmers access to detailed animal reports.
- Farms engaged in SCWS, HerdPlus, and recording live weights.

The contribution of animal recording to beef farm profitability is detailed in *Table 2*. To compare the potential of each system evenly, carcase values from factories were adjusted for other known effects such as carcase type (steer, heifer, young bull), breed, year of slaughter, slaughter age, dam age, dam parity (first calving, second calving, etc), herd size, and factory. The resultant adjusted figure in *Table 2* shows the influence of herd recording on farm profit.

The benefit from data recording, in terms of carcase value, gradually increases in herds as data recording becomes more and more comprehensive.

Participation in schemes like SCWS or HerdPlus have a similar effect on farm profitability (€35/carcase). These benefits can potentially be doubled (€80/carcase) when weight recording becomes part of farm recording (category four). An additional carcase value of €20 can be added to account for the use of more profitable genetics in group four. The level of data recording in Ireland has increased dramatically in the last ten years. This is having a positive influence on farm profitability.

The ICBF database is central to these advancements as it collects, evaluates and distributes data generated from multiple sources in the beef industry.

Table 2: Comparison of carcase value across four herd categories

Herd category	Herds	Animals	Carcase weight	Carcase value	Gain above herd category one
1. No recording	4,792	75,544	341	€1,076	
2. SCWS	18,325	363,828	348	€1,106	€30
3. SCWS and HerdPlus	5,856	167,716	352	€1,119	€43
4. SCWS and HerdPlus and weight recording	509	26,252	363	€1,155	€79

Promoting the service.

- Media
- BTAP
- Letters to herds on ICBF HerdPlus.
- Letters to breeders.

ICBF.com

Weighing pays!

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- Animals from herds that are weight recording, returned an extra €79/animal at slaughter.

IRISH CATTLE BREEDING FEDERATION

€uro-Star Implementation

Andrew Cromie.

National Development Plan
Transforming Ireland

€uro-Star Implementation.

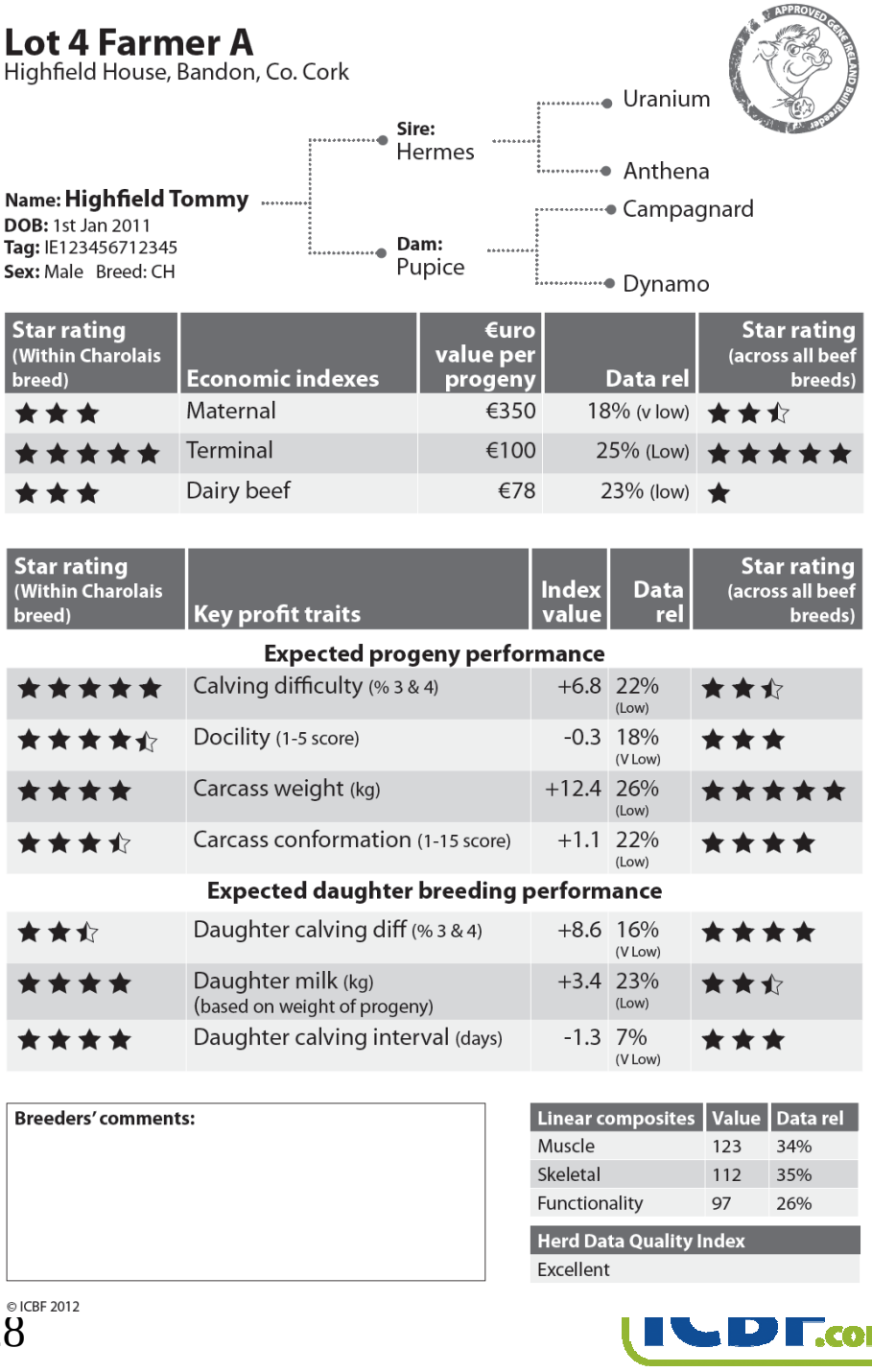
- New indexes (maternal, terminal & dairy beef) introduced as part of next proof run (20th August 2012).
- Implementation group currently working on three areas:
  - Design of material.
  - Research priorities.
  - Roll-out plan.
- Sub-groups established. Good progress being achieved.

Design of material.

- €uro-Star template (bull search, sales catalogues, AI catalogues….).
- Herdbook on-line.
- ICBF Herd-Plus profiles.
- Suckler cow reports.
- New €uro-Star report.
- ICBF Active Bull List.
- Others……..
- Worked on a phased basis. Released at various stages from 20 August.

€uro-Star Template (i)

- Standard template for entire industry. *Key for effective extension.*
- Will not suit everyone!



Lot 4 Farmer A
Highfield House, Bandon, Co. Cork

Name: Highfield Tommy
DOB: 1st Jan 2011
Tag: IE123456712345
Sex: Male Breed: CH

Sire: Hermes
- Uranium
- Anthena

Dam: Pupice
- Campagnard
- Dynamo

Star rating (Within Charolais breed)	Economic indexes	€uro value per progeny	Data rel	Star rating (across all beef breeds)
★★★	Maternal	€350	18% (v low)	★★½
★★★★★	Terminal	€100	25% (Low)	★★★★★
★★★	Dairy beef	€78	23% (low)	★

Star rating (Within Charolais breed)	Key profit traits	Index value	Data rel	Star rating (across all beef breeds)
	Expected progeny performance			
★★★★★	Calving difficulty (% 3 & 4)	+6.8	22% (Low)	★★½
★★★★½	Docility (1-5 score)	-0.3	18% (V Low)	★★★
★★★★	Carcass weight (kg)	+12.4	26% (Low)	★★★★★
★★★½	Carcass conformation (1-15 score)	+1.1	22% (Low)	★★★★
	Expected daughter breeding performance			
★★½	Daughter calving diff (% 3 & 4)	+8.6	16% (V Low)	★★★★
★★★★	Daughter milk (kg) (based on weight of progeny)	+3.4	23% (Low)	★★½
★★★★	Daughter calving interval (days)	-1.3	7% (V Low)	★★★

Breeders' comments:

Linear composites	Value	Data rel
Muscle	123	34%
Skeletal	112	35%
Functionality	97	26%

Herd Data Quality Index
Excellent

€uro-Star Template (ii)

List of male animals entered for sale (in date of birth order).

Lot	Name & prefix of seller	DOB, Sire & MG Sire	Maternal Index (across breed stars)	Terminal Index (across breed stars)	Dairy Beef Index (across breed stars)	G€N€ IR€ Bull Breeder
1	Farmer A Highfield	01/01/2011 CF52 AWB	€194 ★★★★★	€125 ★★★★★	€67 ★★★★★	
2	Farmer B Shinagh	03/01/2011 MVO CF52	€123 ★★★	€132 ★★★★★	€70 ★★	

- Simple listing appropriate for catalogues (first page), but also other reports, e.g., “simple” sales catalogue, “New” €uro-Star reports.
- Farmer looking to buy maternal bull, terminal bull and/or dairy beef bull.

Feedback to-date.

- Three generations of back pedigree.
- Include relevant ID numbers within pedigree.
- Animal ID with lot number, not owner. Owner on line 2.
- Include owner (& breeder – if different).
- Additional information – not breeder comment box.
- Text descriptor, e.g., Calving difficulty (% 3 & 4). *Bulls less than 6% are improving this trait.*
- Data reliability in full (not data rel).
- Data reliability box (see next slide).

Data reliability box. Some relevant examples.

Young bull for sale (~16 months).

Trait	Own record	Progeny records
Calving	1	0
Pre weaning	1	0
Post weaning	1	0
Daughter fertility	0	0
Daughter milk	0	0

G€N€ IR€LAND Test Sire (Part Tested)

Trait	Own record	Progeny records
Calving	1	253
Pre weaning	1	124
Post weaning	1	98
Daughter fertility	0	24
Daughter milk	0	11

Mature bull for sale (~ 30 months)

Trait	Own record	Progeny records
Calving	1	67
Pre weaning	1	34
Post weaning	1	23
Daughter fertility	0	0
Daughter milk	0	0

Proven AI Sire for Maternal

Trait	Own record	Progeny records
Calving	1	765
Pre weaning	1	234
Post weaning	1	189
Daughter fertility	0	89
Daughter milk	0	78

Other considerations.

- Continue with 5 year rolling base for categorising animals.
  - Concern that “too many” 5 star bulls, but reflect genetic progress.
- Minimum data reliability cut-off. Less than 5% (for any trait), data will not be shown. Trait still included

What next?

- Final “iteration” of €uro-Star template.
- Review by €uro-Star implementation group & industry.
  - Not everyone will be completely happy!
- Sign-off by Monday 30 July.

Research priorities.

- Research to support extension & roll-out.
  - Accuracy of maternal milk proofs – Noirin.
- Research to test & improve accuracy of €uro-Star indexes.
  - Calving performance evaluations.
  - Beef performance evaluations.
  - Stock bull functionality.
  - Female fertility (i.e., age at first calving).
  - Maternal milk and “cross-bred” influence.
- Work in progress. Updates provided at routine industry and herdbook technical meetings.

Roll-out plan (i)

- Meet with all Breed Society Councils:
  - Explain the new Index layout.
  - 1 hour required at each Council meeting.
  - 2 People to present the material.
  - Material must include examples of how bulls that breeders would be familiar with look on the new indexes.

Roll-out plan (ii)

- Send out explanatory material about the new indexes to all breeders.
- Attend breed society Sales this Autumn to explain new indexes to breeders.
  - ICBF attendance at sales to be advertised.
  - Possibility of giving a talk in the ring before the sale commences.

Roll-out plan – Others ideas being followed.

- Teagasc & ICBF Suckler cow conference.
- Linking in with marts, e.g., sales catalogues and/or mart display screens.
- AHI roadshow (as part compulsory BVD program roll-out). Shared platform; BVD & new €uro-Stars.
- Others…

Key dates.

- 20 Aug — New €uro-Star indexes (maternal, terminal & dairy beef), new template & material.
- 11 Oct — Teagasc & ICBF Suckler cow conference.
- 14 Dec — Introduction of *potential* improvements to routine genetic evaluations (e.g., calving, beef, stock bull functionality). Decisions re: implementation taken at future industry consultation meetings.

Validation of milk proofs - Derrypatrick Herd

N McHugh[1],D Minogue[2], & A Cromie[3]

[1] *Teagasc, Moorepark*

[2] *Teagasc, Grange*

[3] *ICBF*

Rationale

- Concern at industry level that, especially maternal weaning weight might not accurately reflect true milk yield in beef cows
- No routine collection of suckler cow milk yield
- Data available from Teagasc Derrypatrick herd

Objective

- To quantify the association between ICBF maternal proofs and "on-the-ground" highly accurate phenotypes
  - Maternal weaning weight → milk yield

Derrypatrick Herd

- 105 first parity cows (2010)
- Milk yield measurement (weigh-suckle-weigh)
  - Strong correlation: weigh-suckle-weigh measurements and pre-weaning performance (0.75)
- Average days in milk 115
  - Range 62 to 149 days
- Average milk yield 6.92 kg
  - Range 1.38 to 13.18 kg

Milk yield

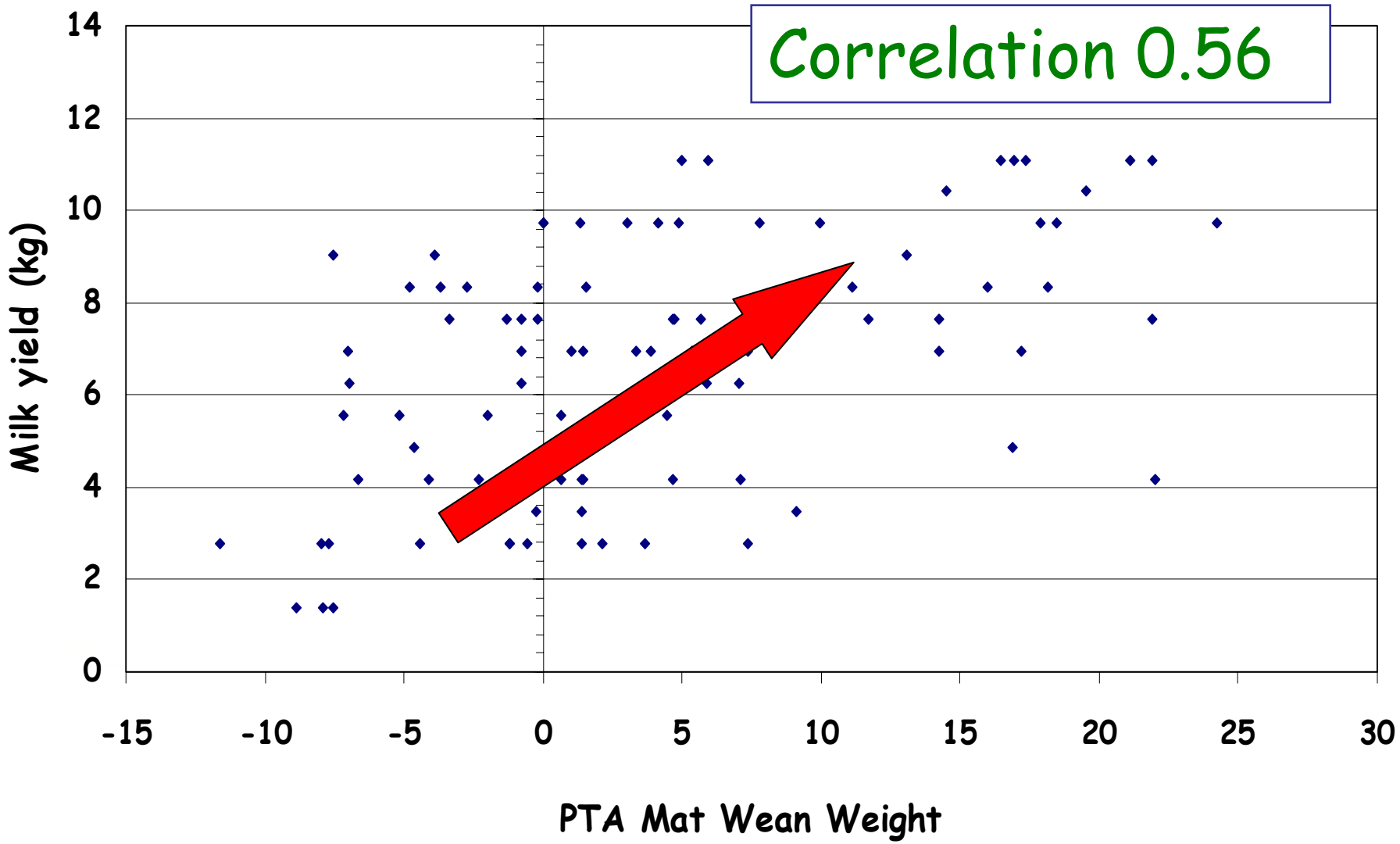
Analysis

- Correlated phenotypic milk yield to maternal weaning weight of the dam
- Heritability = 0.07 (Maternal weaning weight)
  - Expected result ~0.26 (Square root of heritability)

Results

- Correlation 0.56 (milk yield & Mat wean wgt)

Correlation milk yield & PTA maternal weaning weight



Performance differences

- Cows ranked into 5 categories based on milk yield
- Animals with highest performance also had highest PTA
- 8.2kg difference in milk yield between animals of high genetic merit versus low

	Milk yield (kg)	
Ranking	PTA	Perf.
100-80%	12.03	10.7
80-60%	4.88	8.1
60-40%	4.65	6.8
40-20%	1.89	4.6
20-0%	-3.17	2.5
Diff	15.2	8.2

Performance differences

- Cows ranked into 5 categories based on milk yield
- Animals with highest performance also had highest PTA
- 8.2kg difference in milk yield between animals of high genetic merit versus low

	Milk yield (kg)		Calf weight
Ranking	PTA	Perf.	Perf. 3rd August
100-80%	12.03	10.7	197
80-60%	4.88	8.1	186
60-40%	4.65	6.8	179
40-20%	1.89	4.6	176
20-0%	-3.17	2.5	155
Diff	15.2	8.2	

Conclusions

- High correlation between PTA and phenotypic performance:
  - Milk → 8.2 kg between top 20% and bottom 20%
- Experimental treatment effects not known

Teagasc Maternal Beef Suckler Herd

N. Mc Hugh

23rd July 2012

Current industry figures

	Age at 1st calving (months)	Calving Interval (days)	Number of Calvings
¾ Continental	30.4	413.6	2.02
½ Dairy cross	29.8	415.1	2.05

New beef indexes

1. Terminal index → for identification of sires suitable for breeding high profit animals for slaughter
   - Index will replace the current export and carcass sub-index

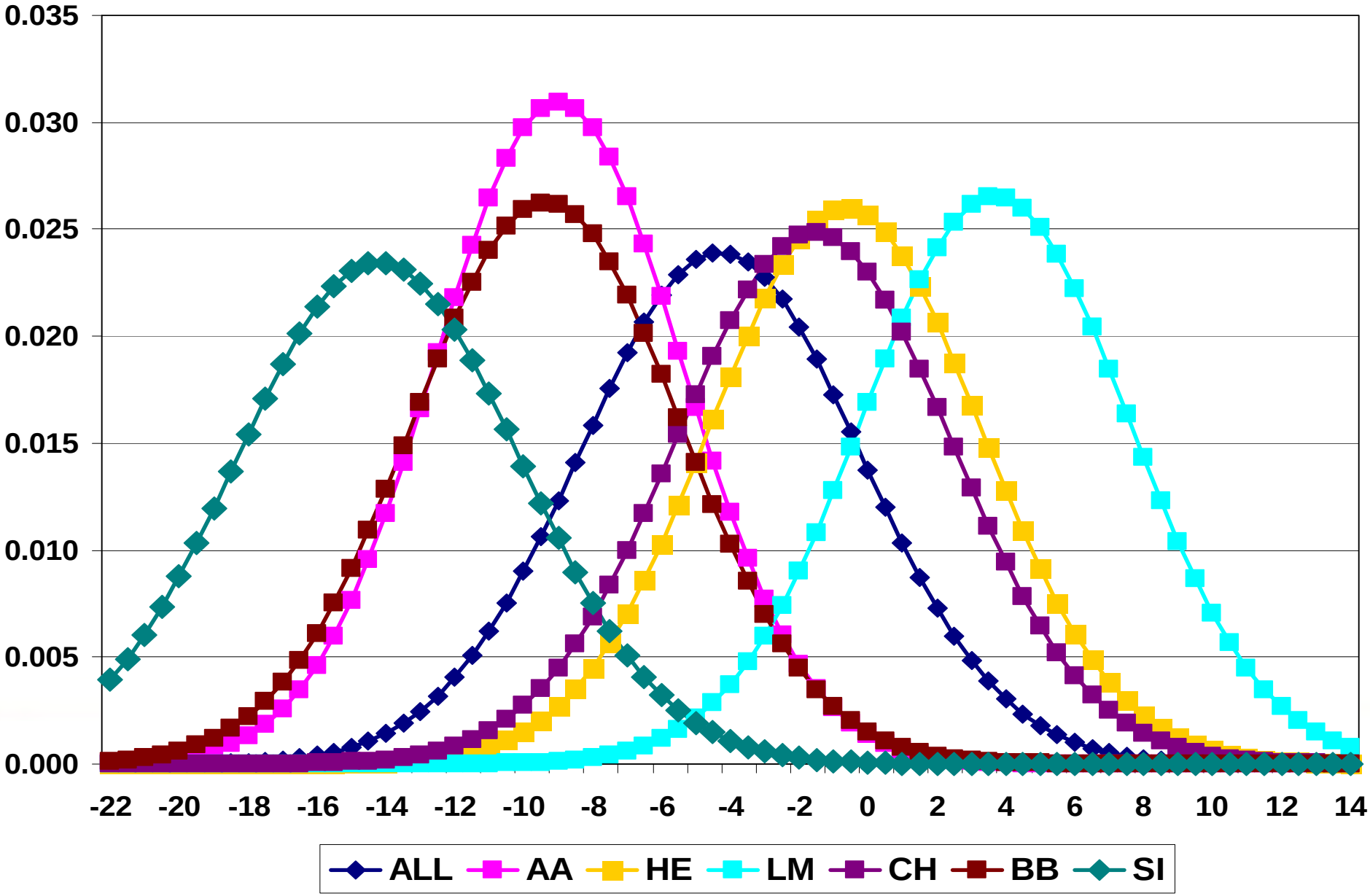
2. Maternal index → for identification of animals suitable for breeding or selecting replacements
   - Index replace the milk and fertility sub-index
   - Account for the calf of the cow also

3. Dairy beef index → for identification of sires suitable for use on dairy cows

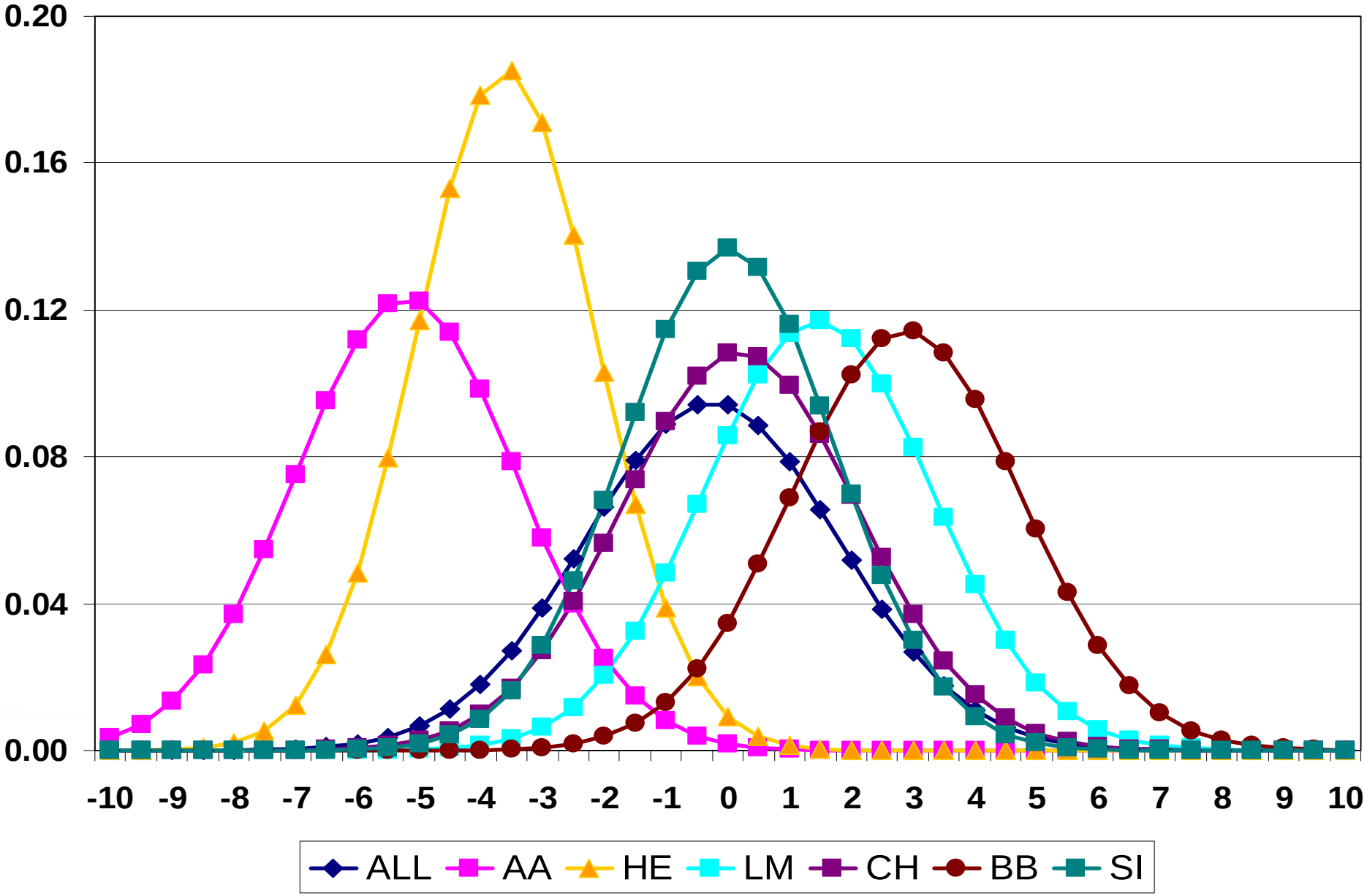
Why validate an index?

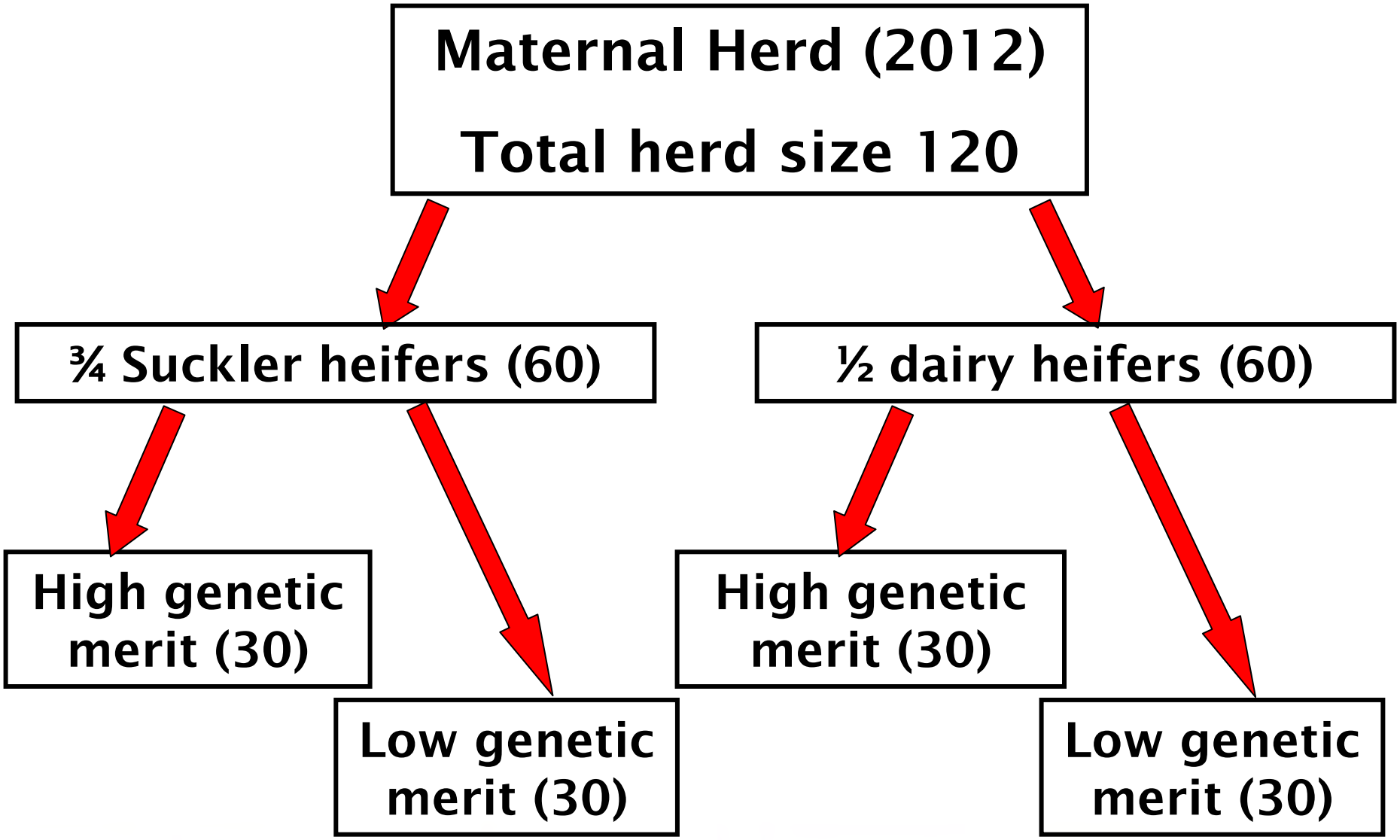
- Breed comparisons allow you to compare breeds
- **But** breed will remain stagnant unless superior animals are selected
- Genetic index → reliable tool to achieve genetic gain across **all** breeds
- Large amount of variation **within** all breeds

Variation – Age at first calving



Variation – Calving Interval




Maternal Herd (2012)
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)

1. Cows sourced from the dairy herd

Aim: to evaluate the benefit of the new maternal index for suckler cows produced from the dairy herd

10 bulls high reliability bulls (AA and LM) selected based on their maternal index

- 5 of high genetic merit
- 5 of low genetic merit

Progress to date

- Over 100 heifer calves identified and blooded
- Awaiting disease status results
- Purchase in next 2 weeks

2. Cows sourced from the suckler herd

Aim: to evaluate the benefit of the new maternal index for suckler cows to drive profitability further

- compare on the ground performance

10 high reliability bulls (AA and LM) selected on their maternal index

- 5 of high genetic merit
- 5 of low genetic merit

Progress to date

- Heifers of interest identified
- Letters sent to farmers in next two weeks

Data recording

Calves

- Calf management
- Health

- Heifer management
- Target weights

- Puberty
- Age at first service
- Health
- Lameness

- Age at first calving
- Performance
- Milk yield
- Calving interval
- Longevity

Conclusions

- New maternal index will be validated
- Applicable across replacement strategies
- Allow for the generation of population statistics
  - Age at puberty, age at first calving…
- Demonstration
  - On the ground visual assessment of herd performance for all

Genomic selection in beef cattle

Donagh Berry[1] & Francis Kearney[2], Ross Evans[2], Mike Mullen[3], and Andrew Cromie[2]

[1]Teagasc, Moorepark, [2]ICBF, [3]Teagasc, Athenry

donagh.berry@teagasc.ie

ICBF Beef Industry Consultation Meeting, July 2012

Teagasc
Agriculture and Food Development Authority

The Irish Agriculture and Food Development Authority

Basics of genomics

- Everyone has DNA which is unique (except for identical twins)
- DNA remains the same throughout life
- DNA clumps together to make *genes*
- Genes/DNA, <u>interacting with the environment</u> determine whether an animal will grow fast or milk well
- Genetic markers (SNPs – *"snips"*) are tiny pieces of DNA which can be measured easily in a laboratory

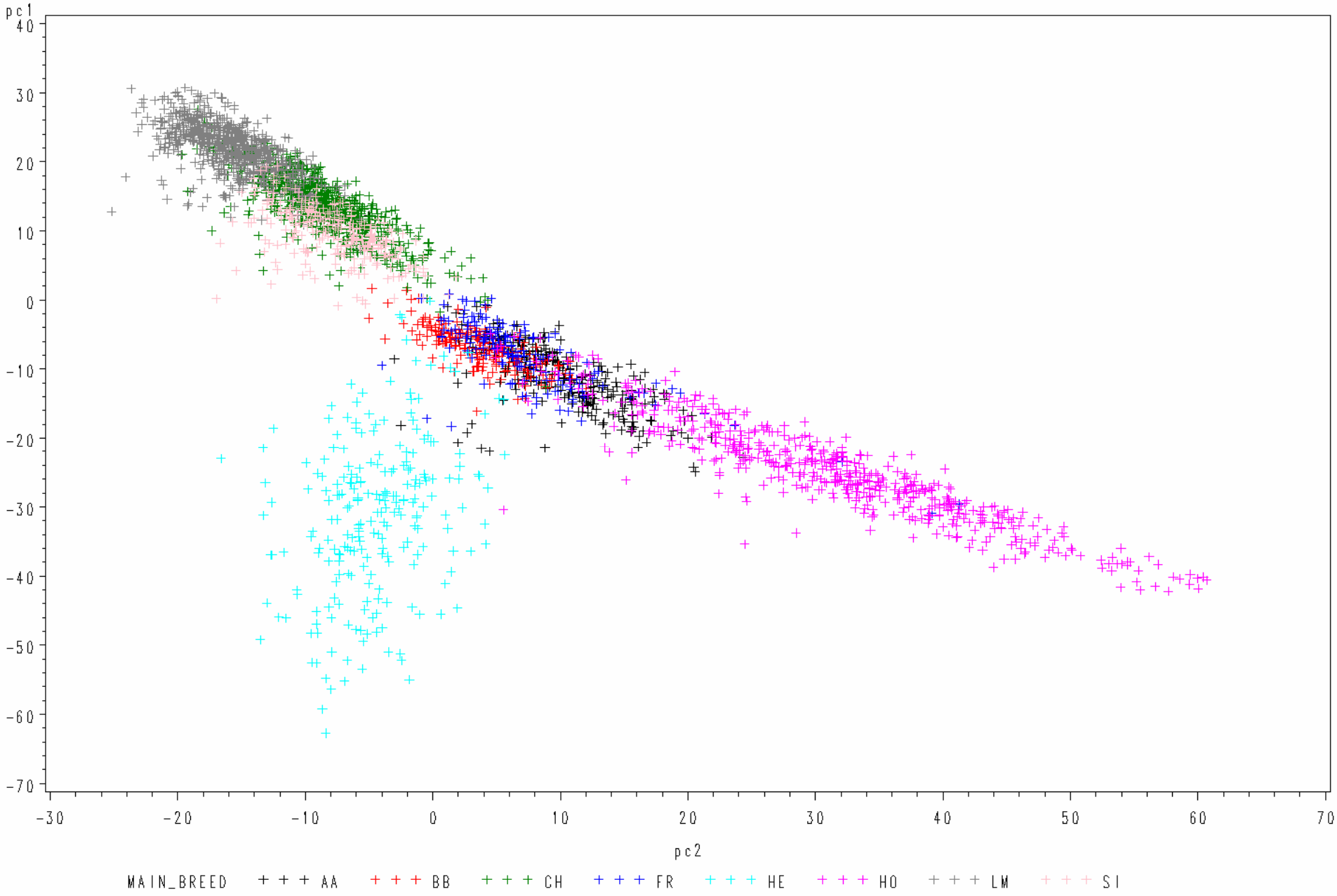
"Genomic selection" v marker assisted selection

- Marker assisted selection
  - Only uses a small number of genetic markers
  - Usually commercially driven (Black box)
  - Generally does not consistently work across populations/breeds/families
- Genomic selection
  - (Hundreds of) thousands of markers
  - Usually driven by national genetic evaluation bodies (with commercial investment)
  - Does work – experience from dairy

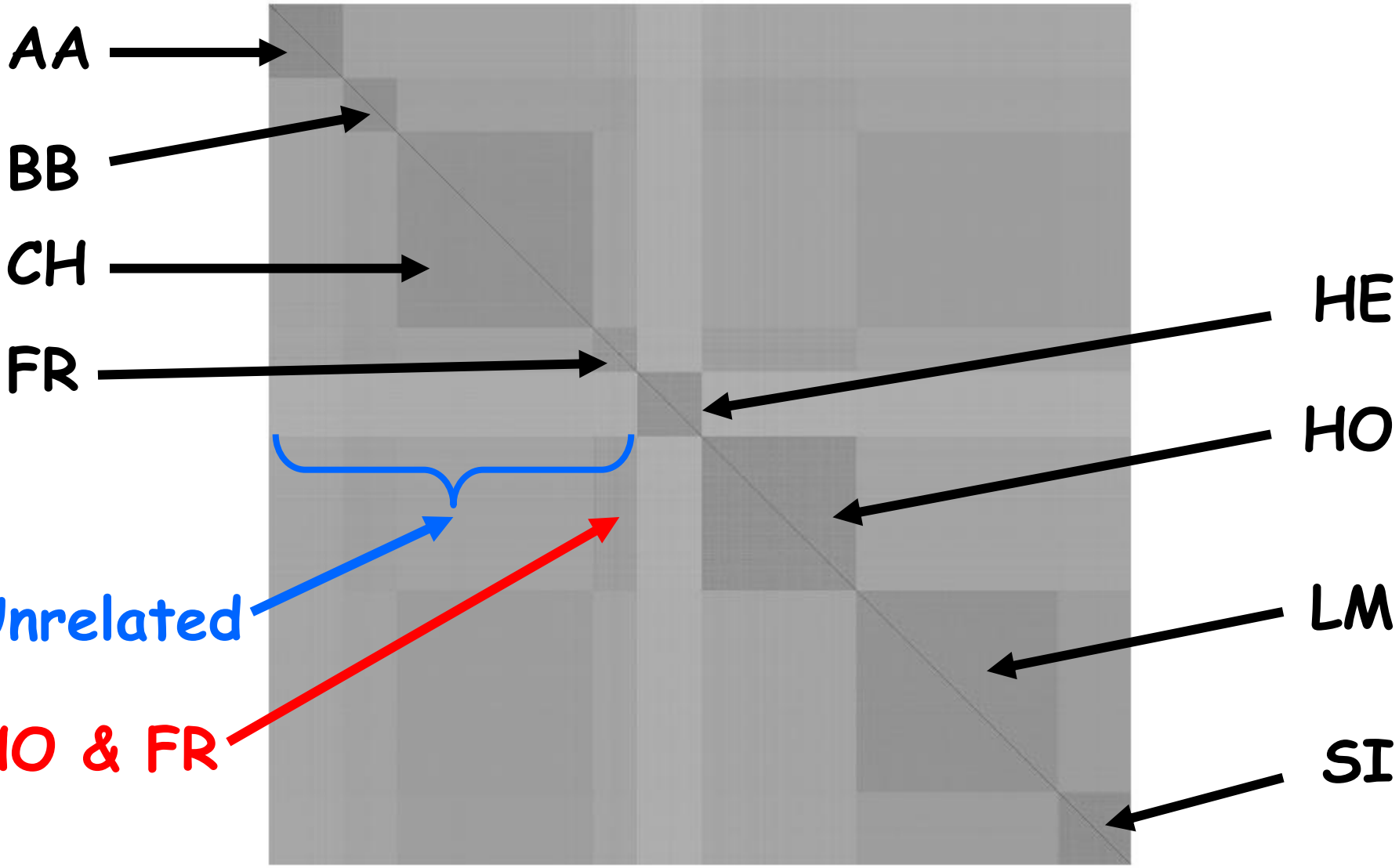
Current status

Breed	Total	Carcass wt	Direct calv. Diff.	Fertility
LM	730	672	709	167
CH	710	674	684	140
BB	196	157	190	45
HE	234	201	222	58
HF	721	701	707	145
SI	264	239	248	81
AA	269	235	256	48
TOTAL	3124	2879	3016	684

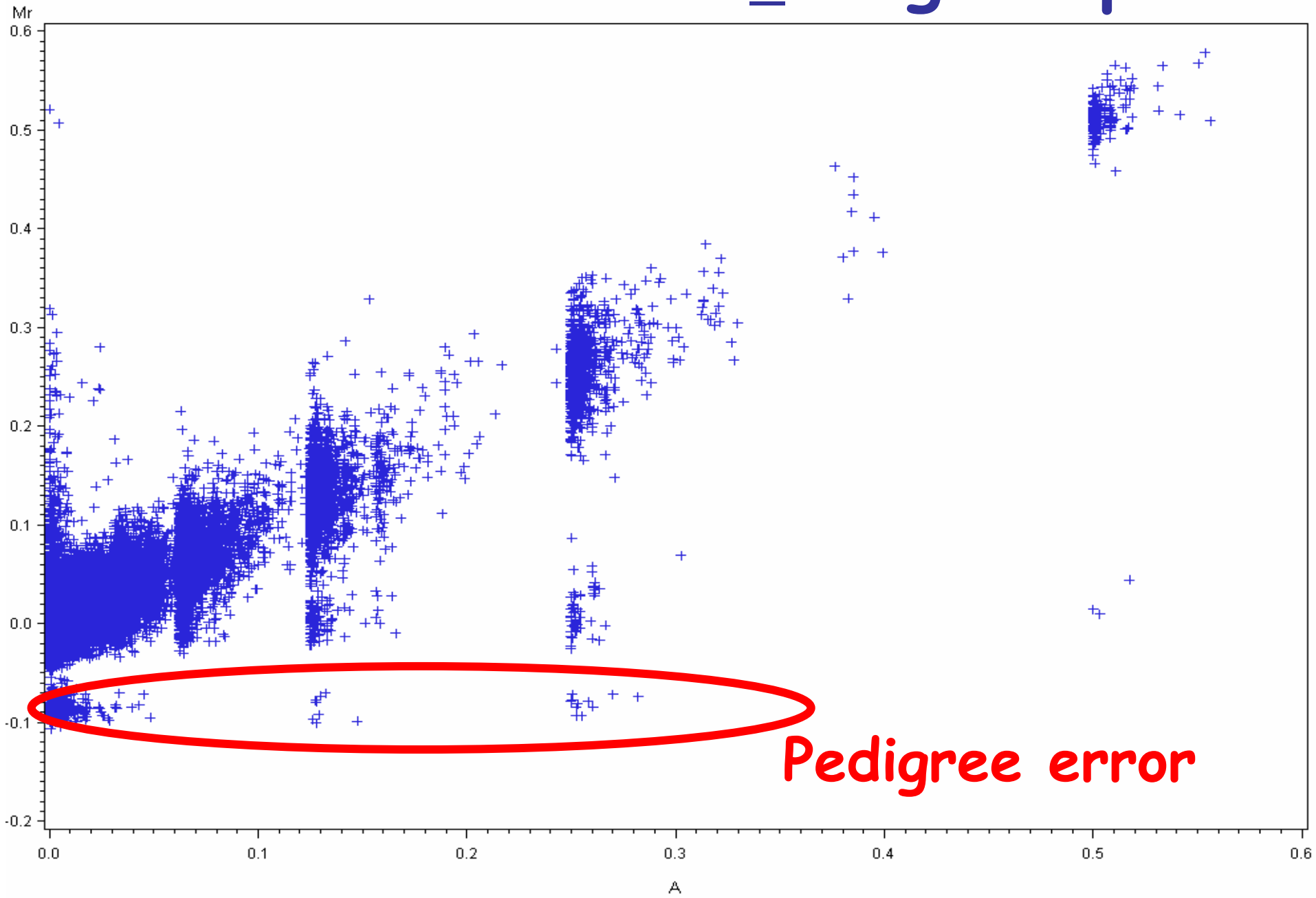
Population stratification - BTA1



Genomic relationship matrix



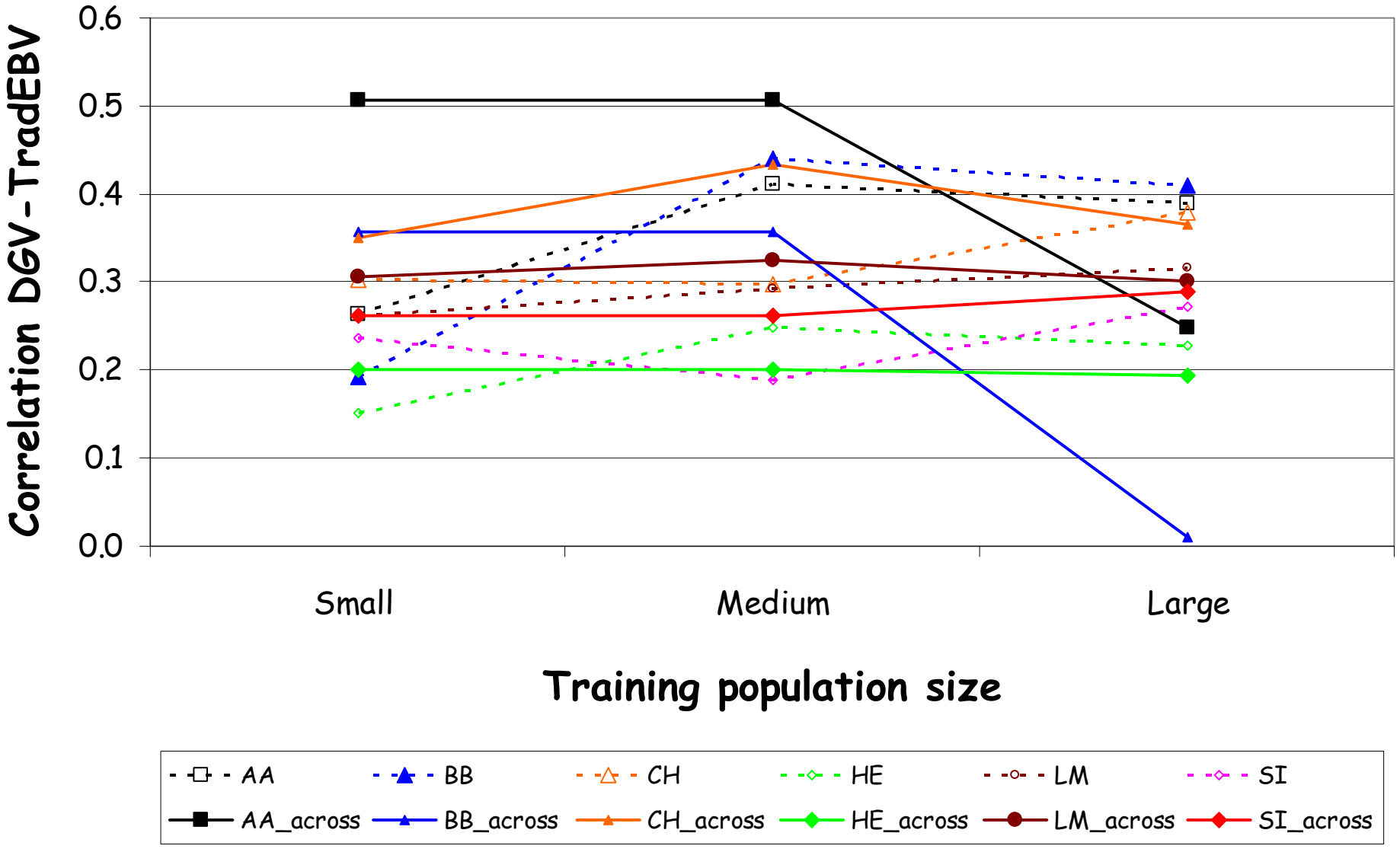
Limousin – Genomic v Avg. Expect.



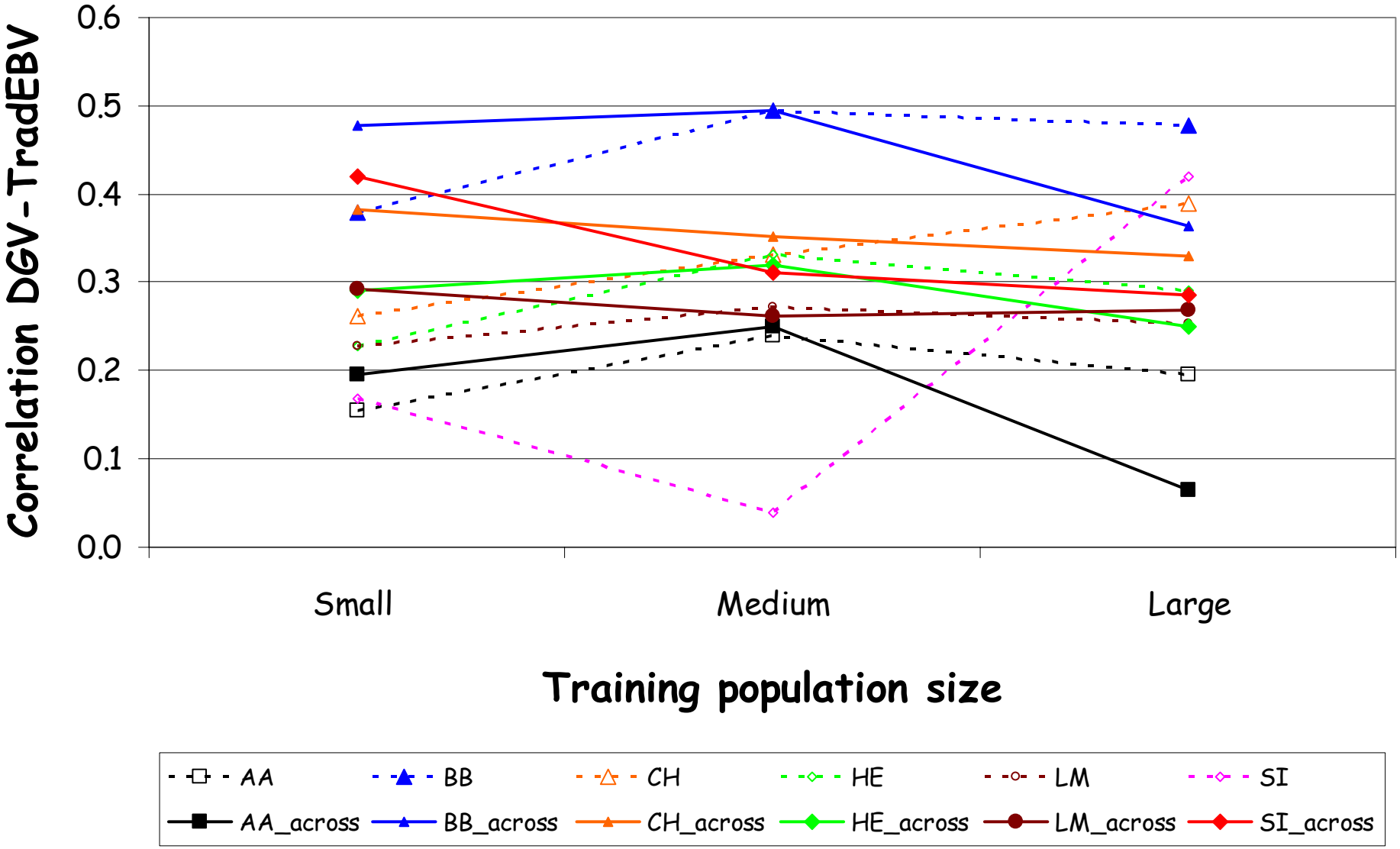
Testing genomic predictions

- Reference/Training population
  - Estimate genetic marker (SNP) effects
- Validation/candidate population
  - Apply genetic marker (SNP) effects
  - Here we know the traditional EBVs so want to know how good we can predict
- Across breed or within breed
- Varying size of training population

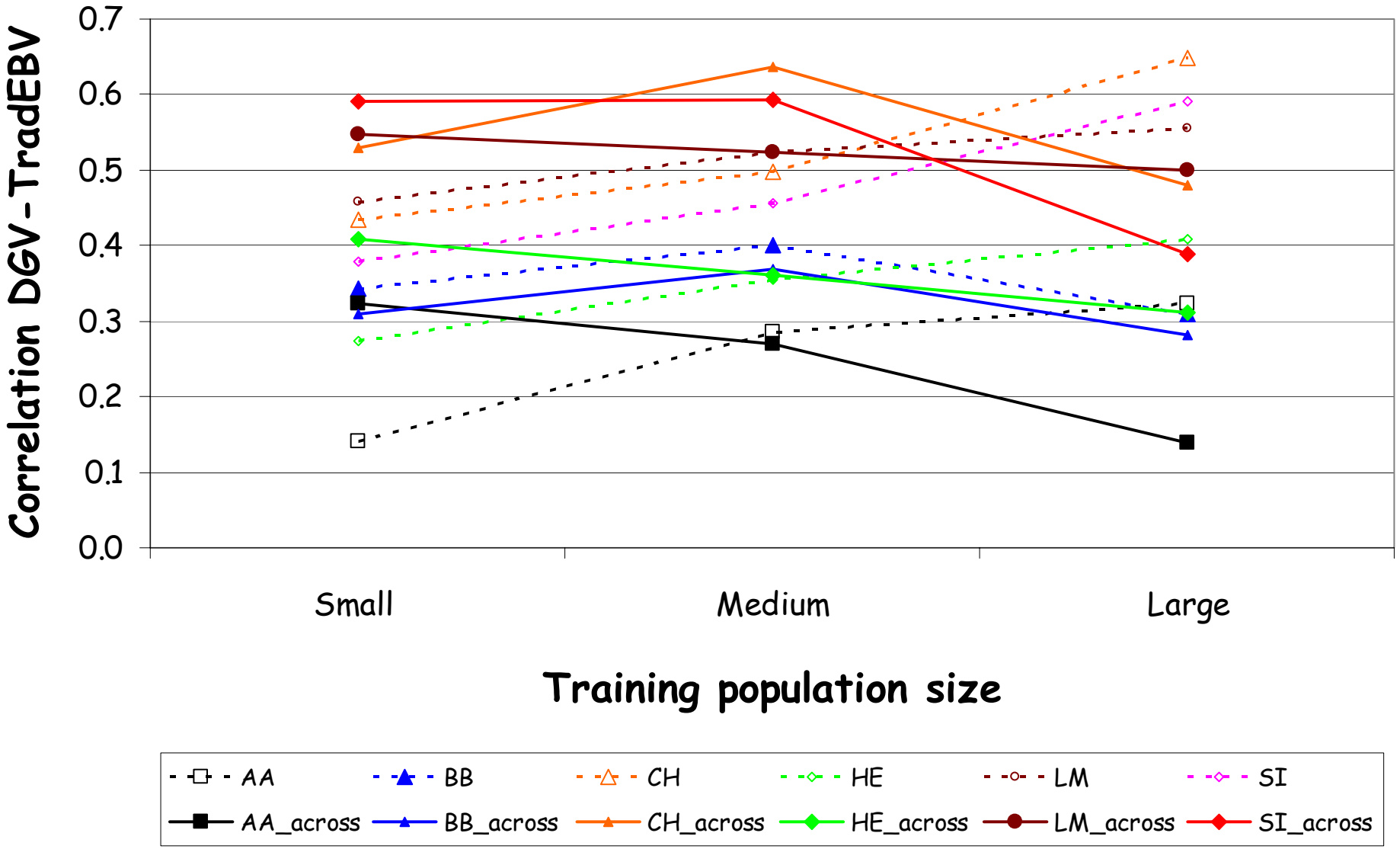
Carcass weight



Carcass conformation



Carcass fat


Correlation DGV-TradEBV
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Small
Medium
Large
Training population size
AA
BB
CH
HE
LM
SI
AA_across
BB_across
CH_across
HE_across
LM_across
SI_across

Conclusions

- Improvements in accuracy from genomics
  - ~5% increase in reliability
  - In line with expectation based on training population size
  - Poorer than dairy genomic evaluation but not too much compared to launch in Spring 2009
- Need more genotypes…fast!!

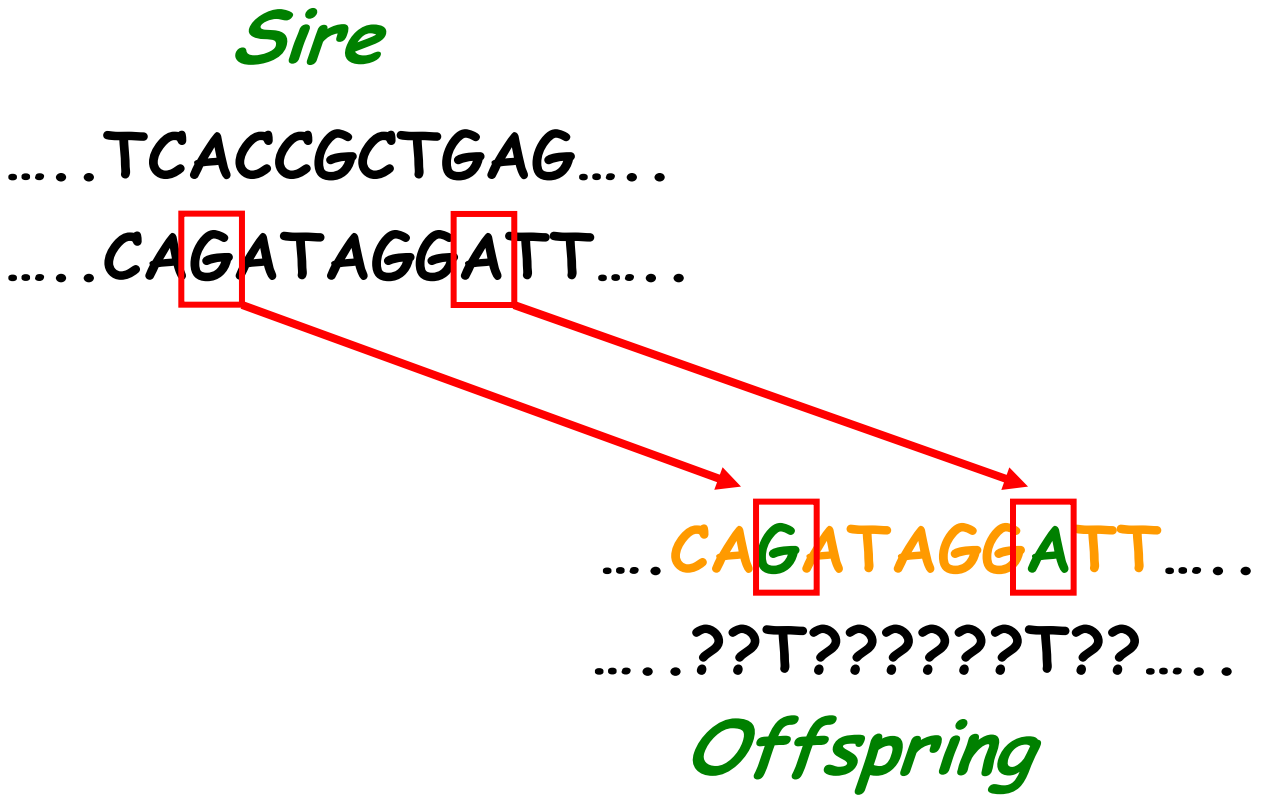
Imputation

Motivation

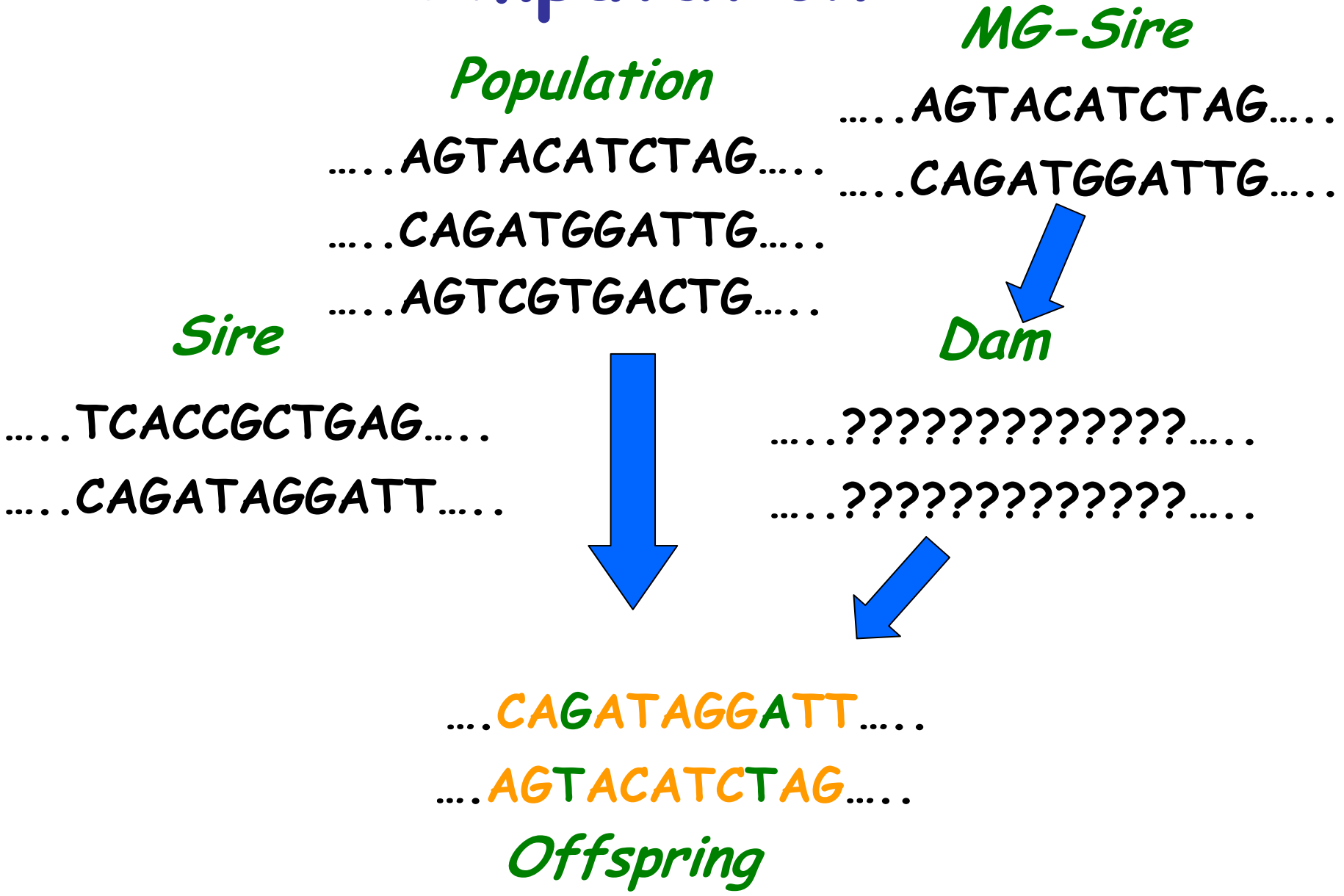
- Beef genomic predictions use 777,962 genetic markers (SNPs)
  - Cost ~€125
- Dairying AI bulls use 54,001 SNPs
  - Cost <€99
- Dairy cattle screening 6,909 SNPs
  - Cost ~€30
- Can we reduce the cost of genomic selection

Imputation

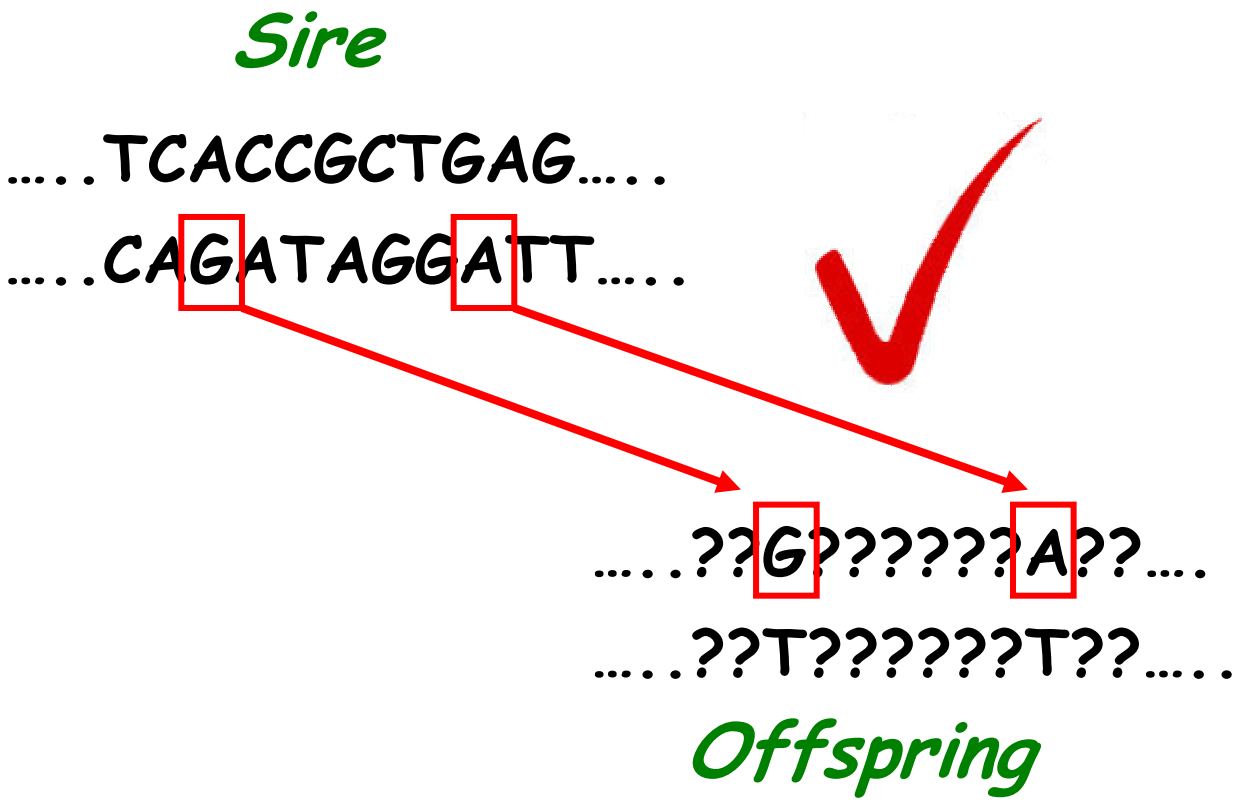
Imputation



Imputation


MG-Sire
Population
…..AGTACATCTAG…..
…..CAGATGGATTG…..
…..AGTACATCTAG…..
…..CAGATGGATTG…..
…..AGTCGTGACTG…..
Sire
Dam
…..TCACCGCTGAG…..
…..CAGATAGGATT…..
…..????????????…..
…..????????????…..
….CAGATAGGATT…..
….AGTACATCTAG…..
Offspring

Parentage



Parentage

Database

Sire 1 …..TCGGGCTGTG…..

Sire 2 …..CAGATAGGATT…..

Sire 3 …..TCACCGCTGAG…..

Sire 4 …..CAAATAGGCTT…..

Sire

…..TCACCGCTGAG…..

…..CAGATAGGATT…..

…..??A?????C??….

…..??T?????T??…..

Offspring

Parentage

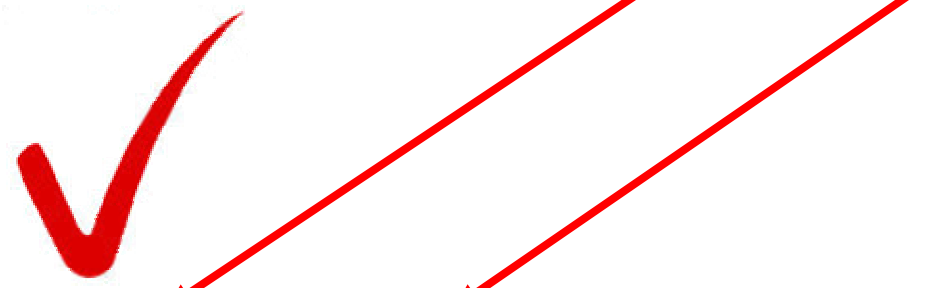
Database

Sire 1 …..TCGGGCTGTG…..

Sire 2 …..CAGATAGGATT…..

Sire 3 …..TCACCGCTGAG…..

Sire 4 …..CAAATAGGCTT…..



….CAAATAGGCTT…..

…..??T??????T??…..

Offspring

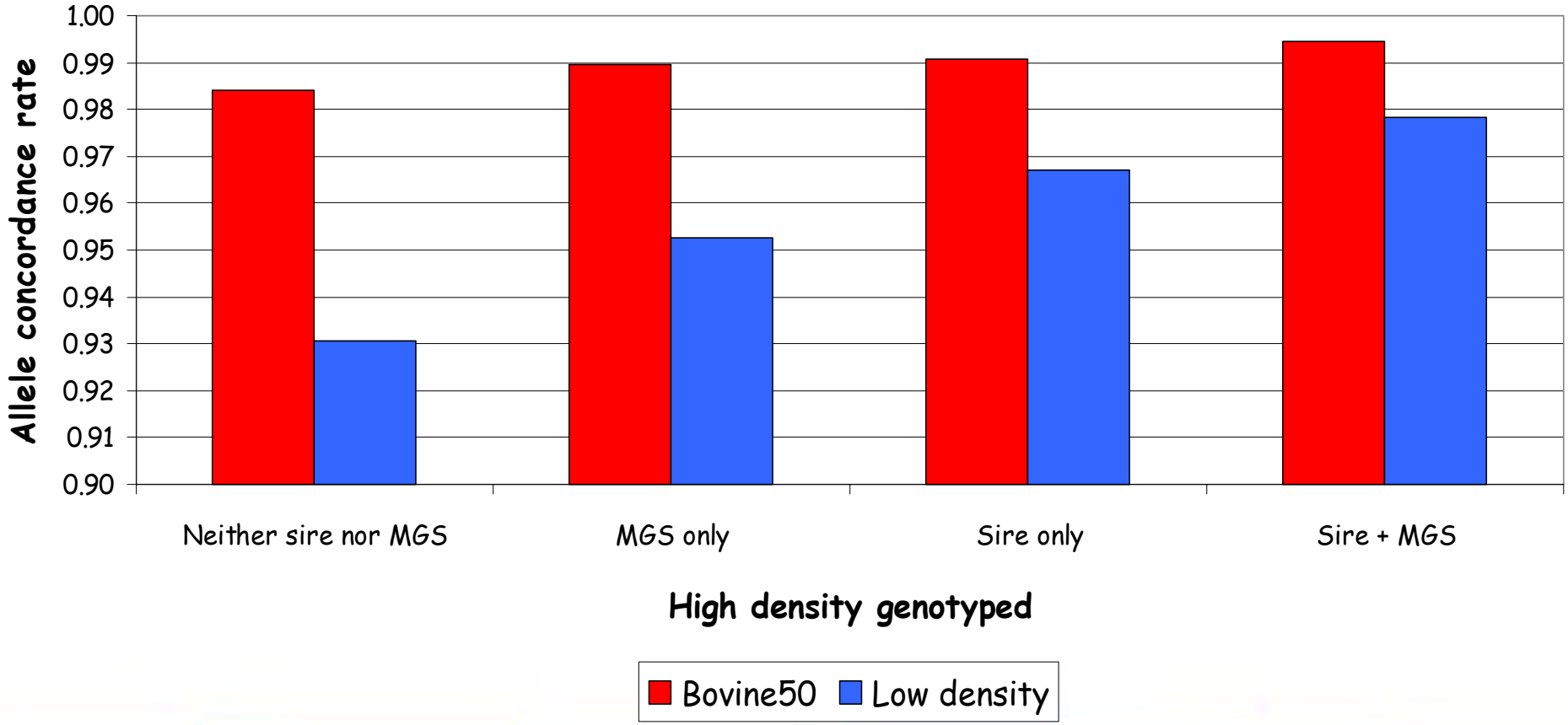
Testing imputation

- 99% accuracy of imputation in dairying

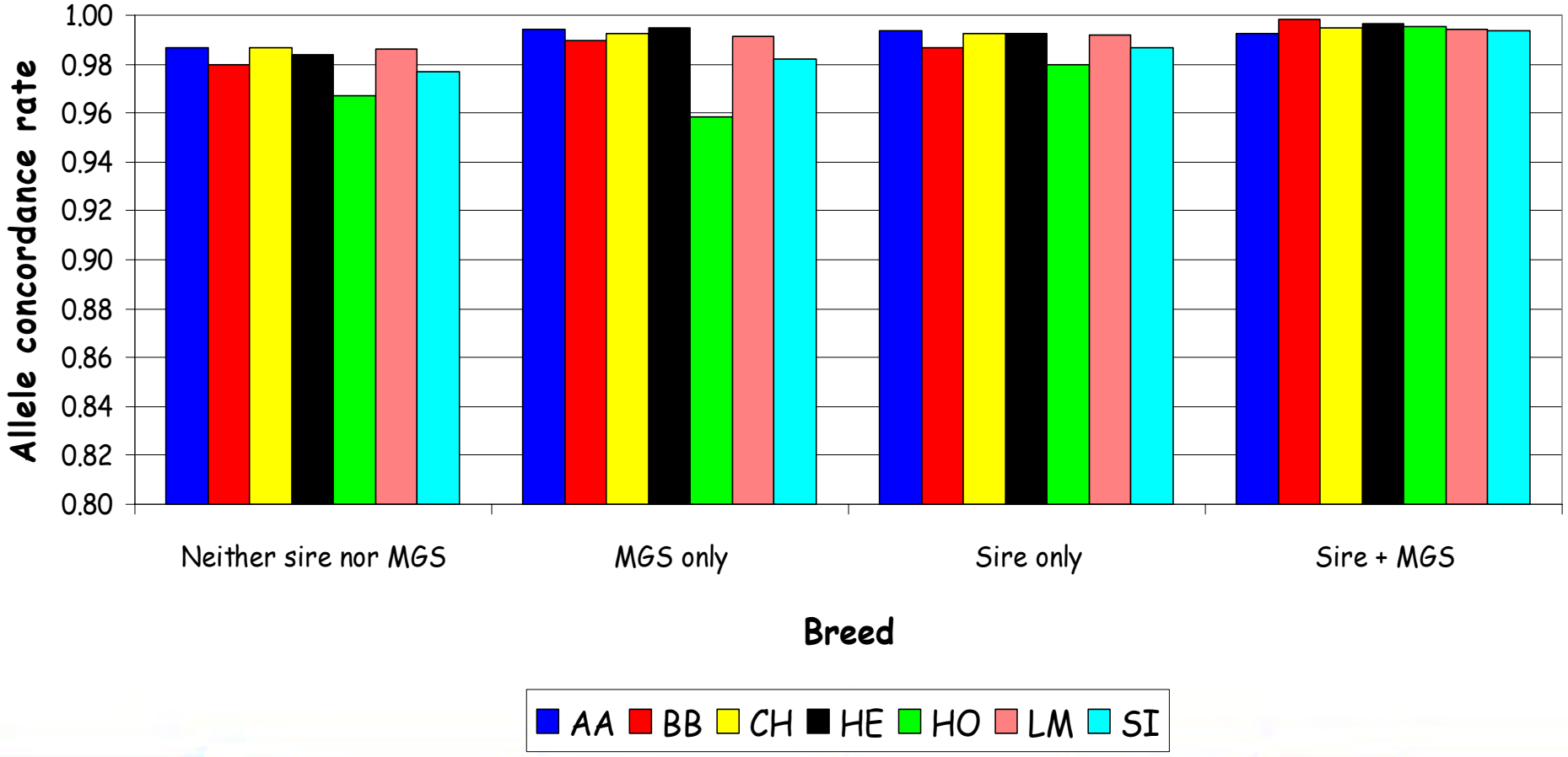
- Test animals born since 2005 or at least
  - 698 bulls
- Training population 2,426 animals

- Results from chromosome 29 (similar across chromosomes)

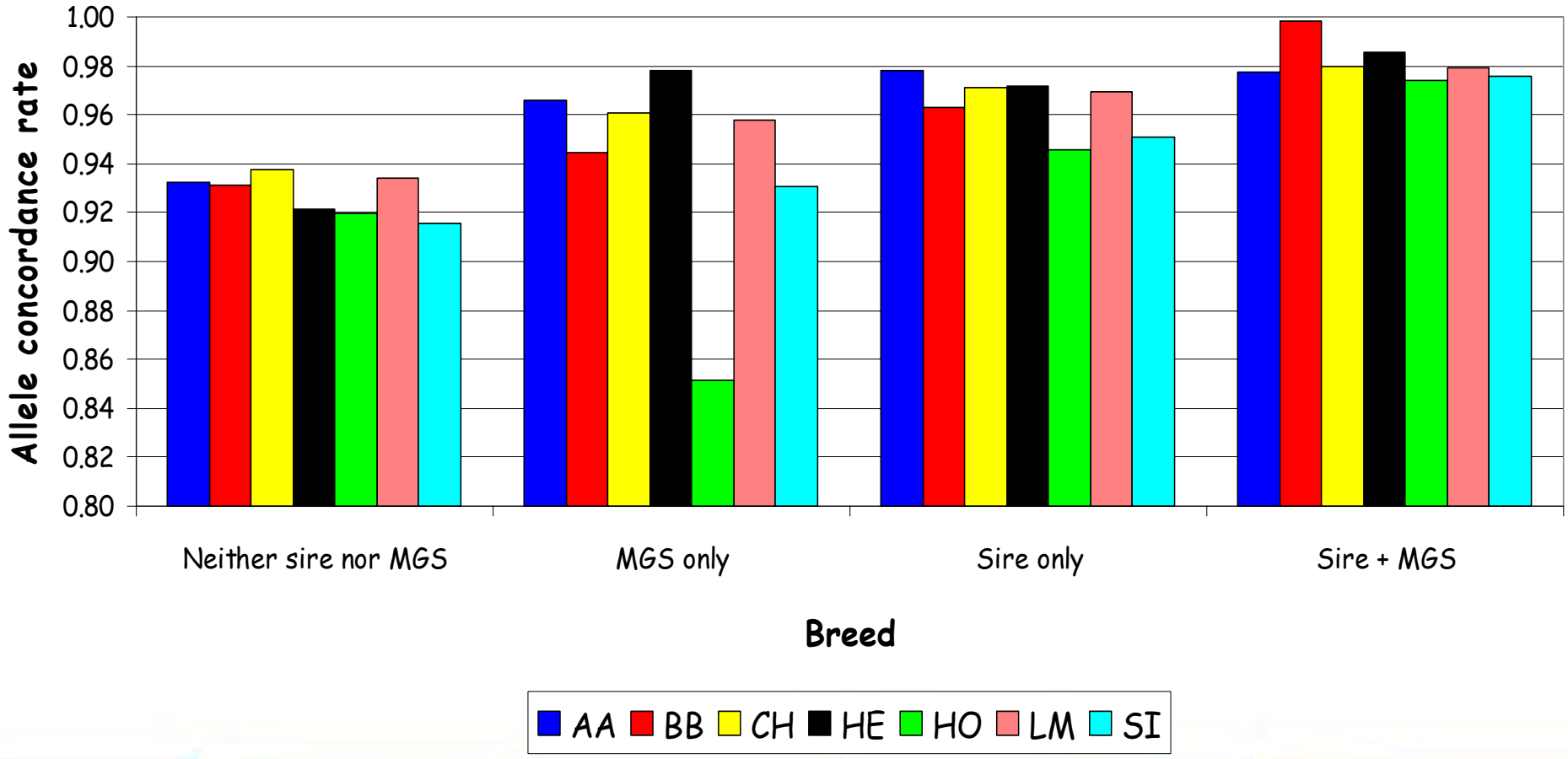
Accuracy at imputing HD genotypes



Accuracy at imputing HD genotypes by breed - 50k



Accuracy at imputing HD genotypes by breed - LD



Genomic Selection Funding

- Teagasc (€0.1 m)
- ICBF (€0.2 m)
- Competitive funding (€0

+

ur

- Bree
- AI sta

ological material

Personnel time

€0.4 million cash – genotypes

Funding internationally

- Breed herdbooks
- AI stations
- Government
- Commercial (non-AI) companies

Proposition

- Breed societies each contribute €5,000
- ICBF & Teagasc each match fund €5,000 (ring-fenced per breed)
- Moderate to high reliability bulls
- Combination of low density (where sire + MGS available) and high density genotypes
  - ~200 genotypes per breed
- You chase me not me chase you!

Conclusions

- Genomic selection is an improvement on traditional evaluations
- Need (lots!) more genotypes on performance/progeny recorded animals
- More testing with a view to implementation
- Discuss strategy for implementation

To-do list

- Clean up pedigree file
  - Recorded relations versus DNA relations
- More genotypes
  - Collaboration – 355 LM from Australia
  - Purchase

To-do list

- Imputation
  - Alternative algorithms and approaches
  - Within and across breeds
  - Microsatellite ←→ SNP (Matt McClure)
- Genomic predictions
  - Alternative algorithms and approaches
  - Within and across breed
  - Series of traits

IRISH CATTLE BREEDING FEDERATION

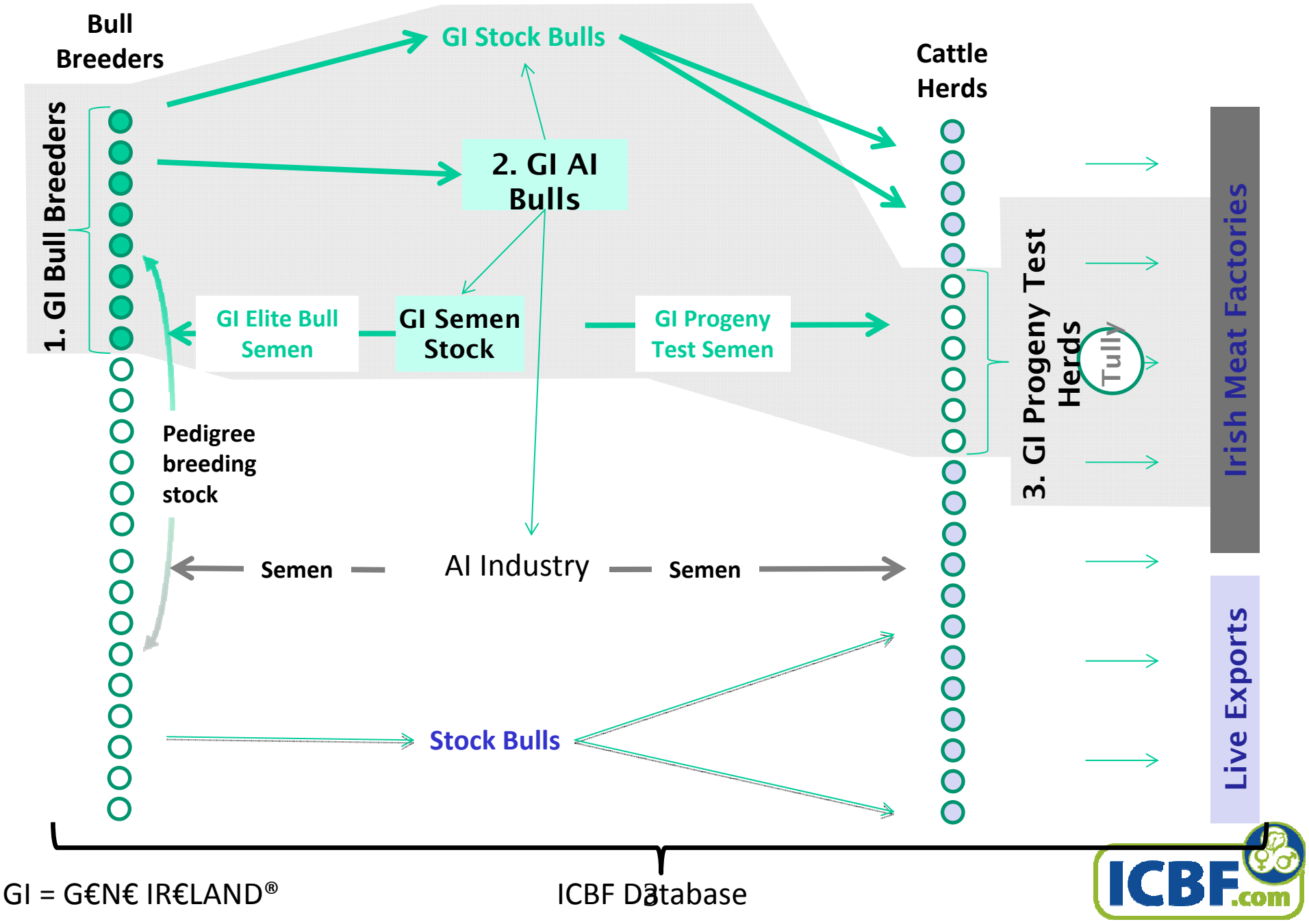
G€N€ IR€LAND Maternal Program Update.

Andrew Cromie

National Development Plan
Transforming Ireland

Agenda 4 – Beef G€N€ IR€LAND (3.30-5.00)

- Update on program – Andrew Cromie.
- Discussion on draft Terms & Conditions for; (i) bull breeders, (ii) AI companies (semen collection and/or distribution) and (iii) commercial progeny test herds – Stephen Conroy.


Bull Breeders
GI Stock Bulls
Cattle Herds
1. GI Bull Breeders
2. GI AI Bulls
GI Elite Bull Semen
GI Semen Stock
GI Progeny Test Semen
3. GI Progeny Test Herds
Tully
Irish Meat Factories
Pedigree breeding stock
Semen
AI Industry
Semen
Stock Bulls
Live Exports
GI = G€N€ IR€LAND®
ICBF Database
ICBF.com

GI Bull Breeder Herds.

- Meetings underway with herdbooks and/or groups of breeders.
- Promotional articles being developed.
- Feedback very positive.

GI Maternal AI Bulls.

- Initial scan of potential bulls available for program.
- ~20 bulls identified.
- Additional bulls (easy calving and/or terminal) will be tested along side GI Maternal AI bulls.

GI Progeny Test Herds.

- New GI catalogue being developed for Autumn 2012 program.
- First “commercial” cattle purchased for GI progeny test.

Tully Commercials

- 78 Commercial Bulls Purchased
- All bought @ €2.75/kg
- All born between 1st Aug 11 and 30th Sept 11
- All from AI sires & MGS recorded
- 34 Different Sires Represented (16 GI Sires)
- 10 Breeds Represented
- 13 Herdowners

  - 10 of these are GI Herds
- First batch arrived Monday 23rd July

o

GI Working Groups.

- Three working groups established between ICBF, Teagasc & UCD.
  - Carcass & meat eating quality.
  - Health & disease traits.
  - Performance test traits, including feed intake & efficiency.

GI Structure.

- Operated & funded by ICBF. Under ICBF's direction & control.
- Technical working group (ICBF, Teagasc, AI, HB, bull breeders, farmers) reporting to ICBF board.
  - Similar to AHI model.
  - Originally on breed by breed basis. Evolve to multi-breed.

What next?

- Develop Terms & Conditions – Stephen.
- Launch program.
- Identify “existing” bulls for Autumn 2012 program (from AI partners).
- Identify “new” bulls for Spring 2013 program (from AI partners and bull breeders….).

IRISH CATTLE BREEDING FEDERATION

G€N€ IR€LAND
Terms & Conditions.

Stephen Conroy

National Development Plan
Transforming Ireland

Topics to be discussed

G€N€ IR€LAND program terms and conditions for:

1. Bull breeder herds

2. A.I companies
   (semen collection and/or distribution)

3. Commercial progeny test herds

1. Bull breeder herds.
Terms and conditions.

Services provided by GI

- Mating advise
- Guidance on best practice for rearing of young bulls
- Herd Data Quality Index (HDQI)
  - Quality and quantity of data from individual herds
    - Timeliness
    - Completeness
    - Normality (year two of the program)
- Best practice in relation to herd health
  - Management reports

Services provided by GI cont'd

- Facilitate promoting and marketing of participating herds:
  - Pedigree and commercial farmers
  - ICBF website, Herdbooks, media and literature
  - GI bull breeder stamp
- Promote elite young bulls to AI companies
  - Meet the required criteria
- Provide Stock Bull functionality data
  - Index
  - Year two of the program
- Priority access to new technology's
  - Genomics

Services provided by GI cont'd

- Allocate stored semen on the best bulls
  - Used in elite mating's
  - Proven bulls
  - Semen cost (covered by annual fee)

- Semen allocated under the following terms:
  - Members paid up-to-date and signed-up to the program
    - Access to semen collected after the sign-up date
  - Suitability for elite mating's
  - Herd owner can request semen
    - Demand and availability
  - GI program will have full discretion
    - Maximise genetic gain and diversity

Services provided by GI cont'd

- Purchase bulls for the program
  - Only participating herds
  - Bull owner receives payment
    - Passes the AI health testing criteria
      - On-farm & AI quarantine
    - Passes on-farm semen fertility test

- Access to breeder owned bulls
  - Only participating herds
  - Herd owner must:
    - Make available 1000 doses of semen to the program
    - Pay for any additional semen collected
    - Insure the bull at the AI centre

- Allocate personnel to offer advice on the program.
  - Complimentary "start-up" visit
  - Capture data

Conditions of the GI program

- All pedigree herds are eligible to sign-up to the program
- Fee €250 per year
  - 4 year contract
  - Direct debit (where possible)
- Herds must be signed up to HerdPlus
- Health schemes
  - Compulsory herd health schemes (BVD)
  - Voluntary herd health schemes
- GI reserves the right to develop and evolve the program
  - Any changes will be communicated in advance

Conditions of the GI program

- Herds will be excluded if their HDQI does not meet the required standard
  - Index is reviewed after 12 months
  - Receive notification

- Compulsory to record the following traits:
  - Insemination data (all pedigree animals)
  - Birth weight (pedigree calves)
  - Linear score and weight record
    - Pedigree animals between 150 and 250 days of age

- Manipulation of records

- ICBF reserves the right to exclude a herd from the program at any stage.

2. AI companies.
Terms and conditions.

Services provided by GI cont'd

- Transport
- Insurance
  - Except for notifiable diseases
- Health testing prior to entry
  - Herd owner
- Cover the cost of semen collection and storage
  - 1000 doses of semen
- Maintenance of the bull(s)
- Fees in relation to AI code and genetic evaluations
- Progeny test
- List of herds
  - Herd details, number of straws required, nominated AI company

Services provided by GI cont'd

- Purchasing of the bull – AI companies
  - Provide 1000 doses of semen to GI program
  - Bull must be owned by GI program
  - Agree an appropriate fee

- Progeny testing of AI owned bull(s):
  - Genetic merit for new Maternal & Terminal index
  - Relatedness to Irish herd
  - Disease status

- AI company makes available 1000 doses of semen to the GI program
  - ICBF cover the cost of collection and storage

- Breeder owned bull(s):
  - Same as outlined for AI owned bulls

Conditions of the GI program

- Collection of semen
  - 1000 doses of high quality semen
    - 500 doses for progeny test
    - 500 doses for elite mating's
  - 120 period
  - Transport semen to nominated distribution centre

- Distribution of semen
  - Service field operators
    - Nominated by the farmer
    - 10 day (recorded for dispatch)
    - Service provider collects €5 per straw.
    - Delivered in accordance with DAF protocols
      - Health and disease

3. Commercial progeny test herds.

Terms and conditions.

Services provided by GI cont'd

- Catalogue
- Semen on elite bulls
  - €5 per straw
- Herd Data Quality Index (HDQI)
  - Quality and quantity of data from individual herds
    - Timeliness
    - Completeness
- Weight record and linear score GI progeny
  - On-farm (150-250 days of age)
  - GROW report
- Green tag
  - Promote and market females at sales

Conditions of the GI program

- All commercial herds eligible to sign-up
- Minimum of 10 straws per herd
- Herds will be excluded if their HDQI does not meet the required standard
  - Index is reviewed after 12 months
  - Receive notification
  - Manipulation of records
- Compulsory to record the following traits:
  - Insemination data
  - Linear score and weight record
    - GI progeny
- Must be signed up to HerdPlus

Where to next?

- Finalise T & C's based on feedback
- Send a copy of contracts to relevant parties
- Proceed with the roll-out of the program
  - September 2012