



IRISH CATTLE BREEDING FEDERATION

Developments in Dairy Genetic Evaluations

Meeting with Dairy Industry
14th February 2008

Agenda

- 10.30 AM Dairy Breeding Priorities – 2008
- 12.15 PM Active Bull List & publication of proofs.
- 12.30 PM Indexes for high output systems.

Dairy Breeding Priorities.

- Today.
 - Kick-off meeting
 - Priorities for 2008
- May
 - Update meeting with industry.
- September.
 - Decision meeting with industry.

Dairy Breeding Priorities - 2008

1. Improve fertility evaluations – *D Berry*
2. Develop new health indexes – *D Berry*
3. Update the EBI – *D Berry*
4. Update calving performance – *F Kearney*
5. Dairy Linear Type – *F Kearney*
6. Across Breed Proofs – *R Evans*
7. New “culling” index – *R Evans*
8. Dairy Calf Quality – *A Cromie*
9. Farmer management traits – *A Cromie*
10. Others.

What we need you to do?

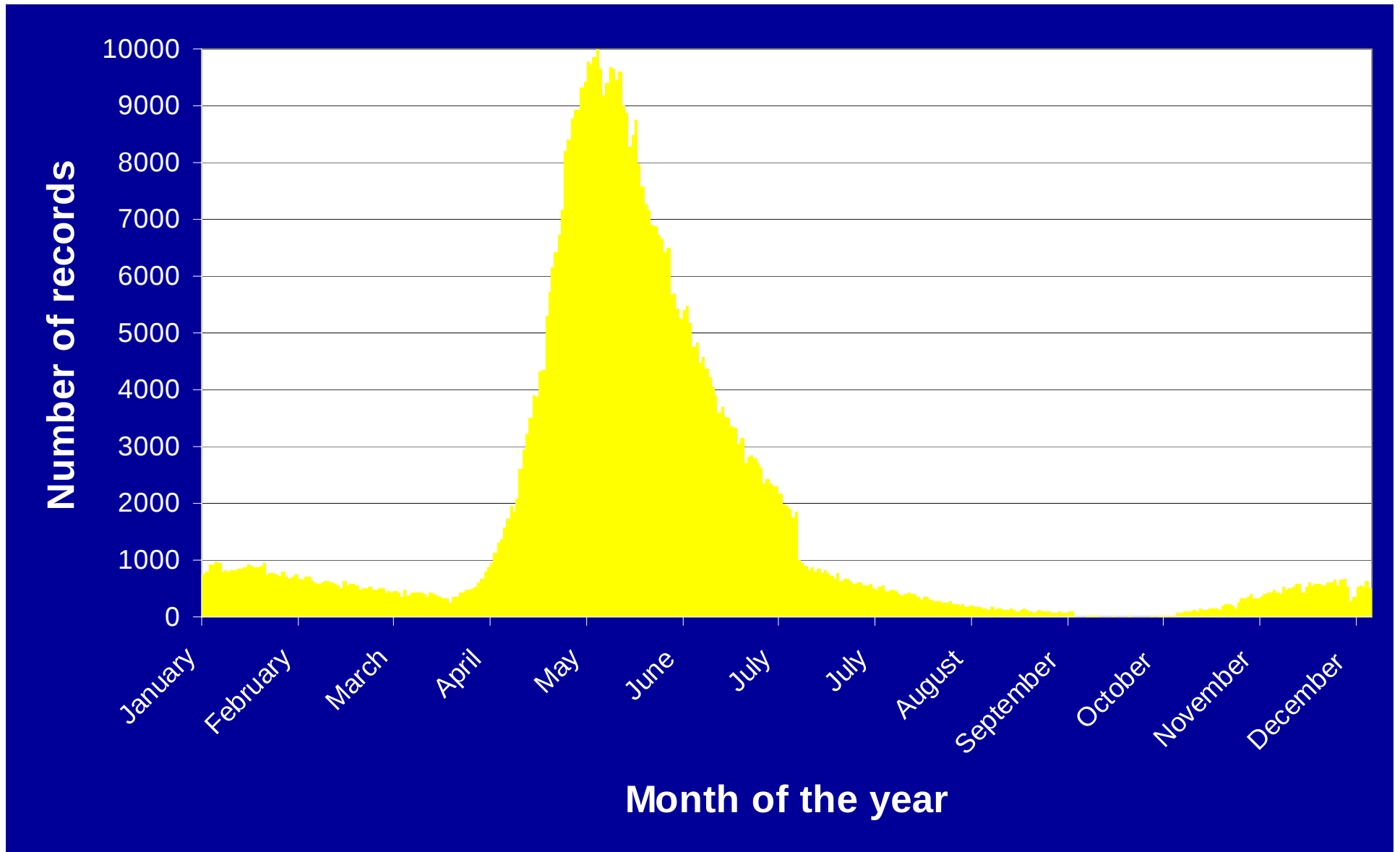
- We will break after each speaker.
 - 10 minutes presentation.
 - 10 minutes questions & answers.
- Score each topic on a 1-5 basis, i.e., 1 for a low priority topic to 5 for a high priority topic.
- Sign your name, including your organisation.
- *Priorities for 2008 will be selected based on your feedback.*

1. Improve female fertility

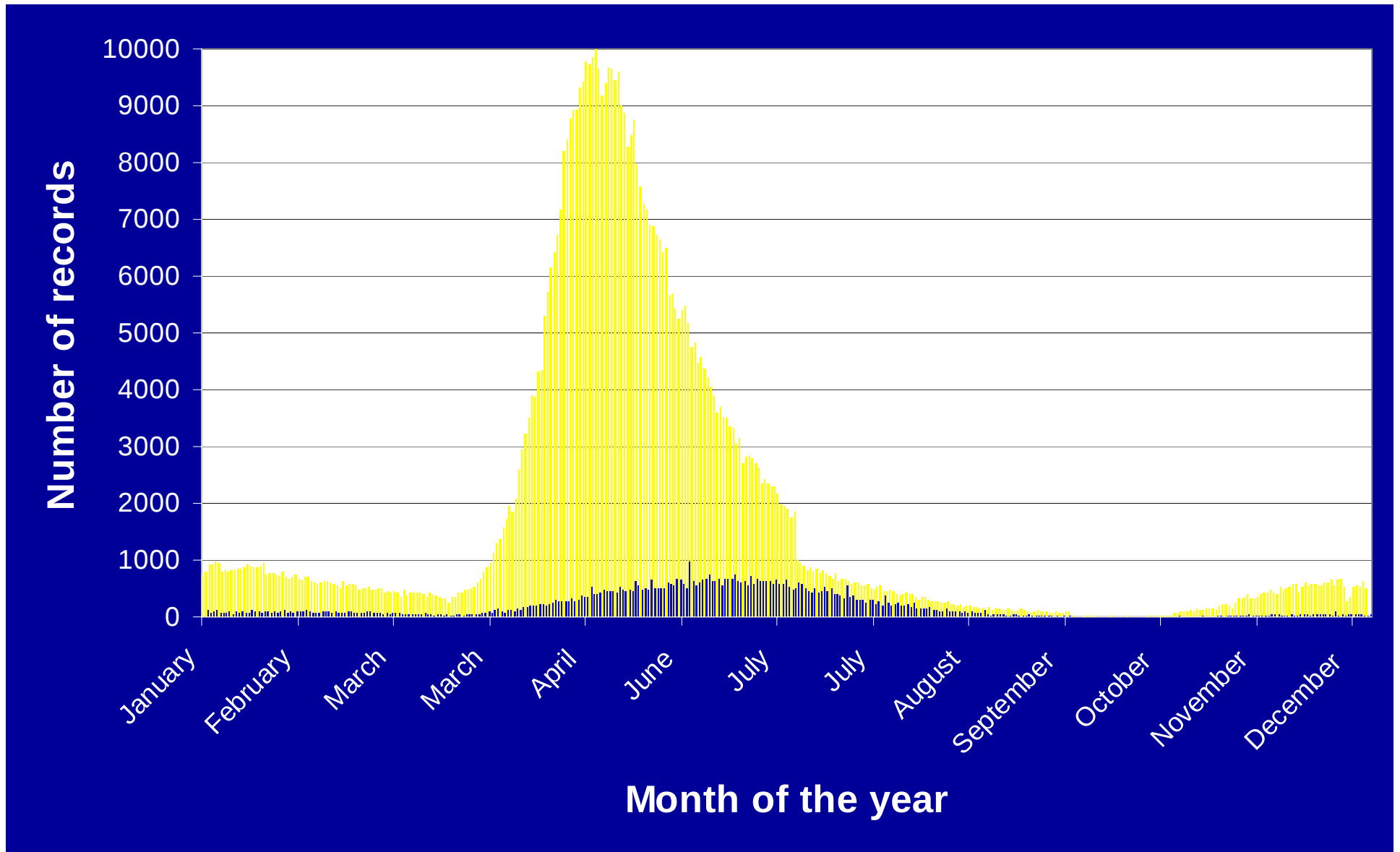
- Calving interval & survival
 - *Only data was calving dates*
- >1 million services / PDs



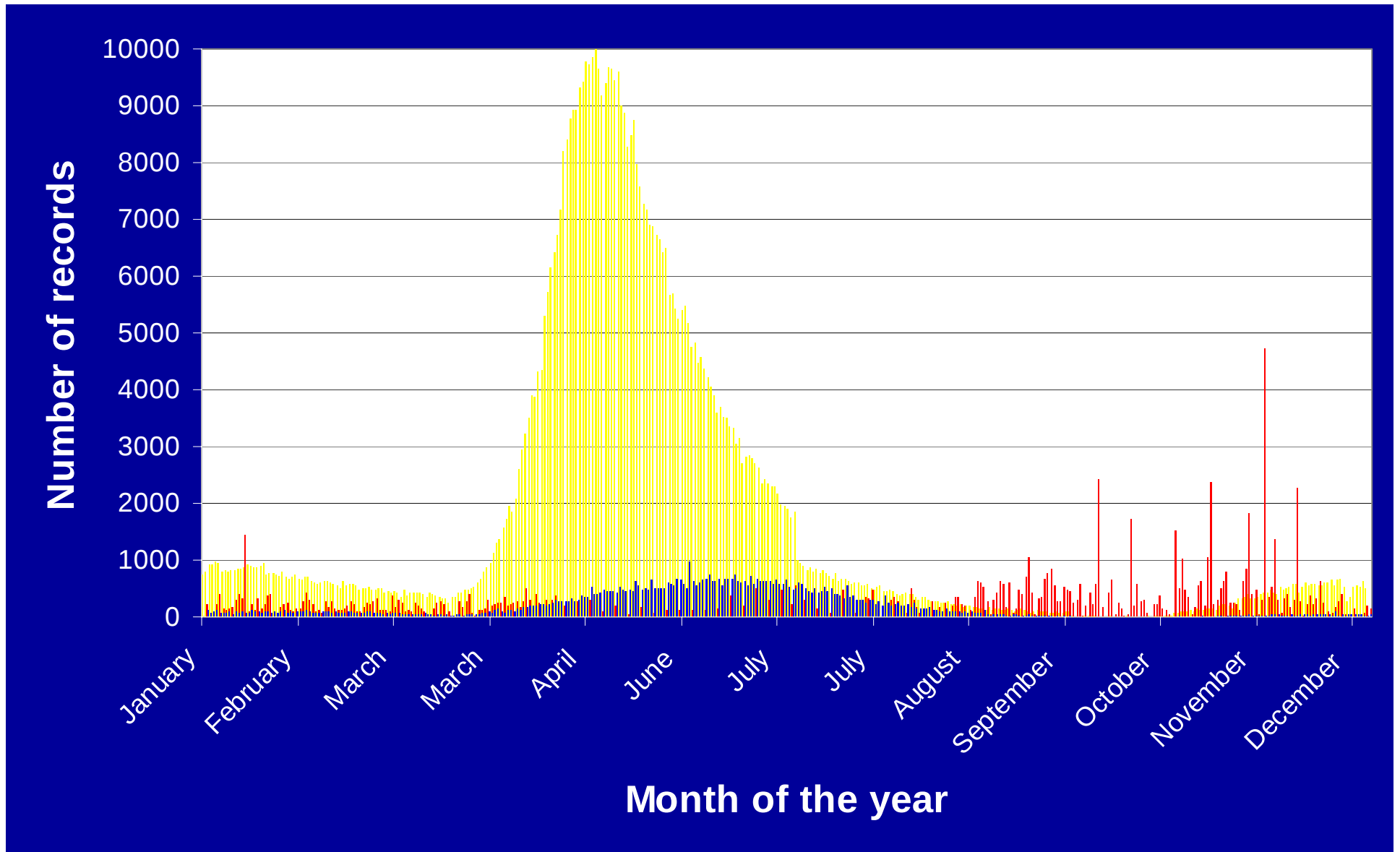
Distribution of data



Distribution of data



Distribution of data



Improve female fertility

- Increase to at least 5 lactations
- Extent CIV edits using inseminations
- Evaluate new fertility traits
 - Include maiden heifers
- MIX99 software
- Test different multi-trait evaluations

2. New health index

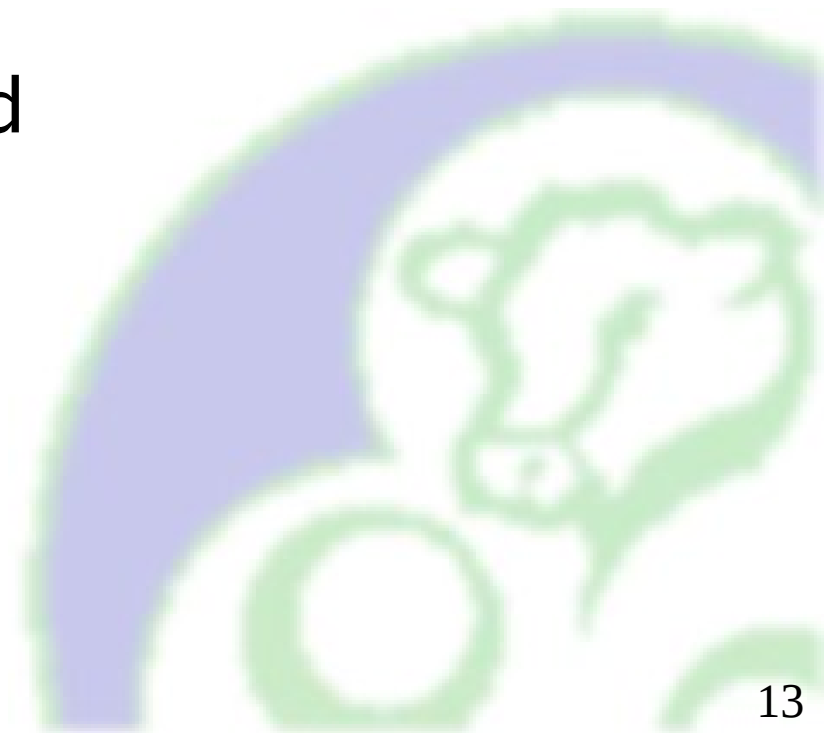
- Currently
 - Lameness $\leftarrow$ Locomotion
 - Mastitis $\leftarrow$ SCC
 - SCC $\leftarrow$ SCC
- Lameness $\leftarrow$ Farm Relief Service
- Mastitis $\leftarrow$ Time for re-evaluation?
- Maybe more traits?????

3. Updating the EBI

- Review of costs/prices
 - What's going to happen in the next 9 months??
- Beef sub-index
 - Potential to replace “progeny beef carcass” with “calf value”
 - Retain cull cow value
- Efficiency index
 - Separate “cull cow” into “carcass” and “maintenance/growth” (i.e., live-weight)
- Continue improvements of Moorepark Dairy Systems Model
 - Areas of industry interest.

4. Calving Performance

- Spring 2008
 - Moved to new software
 - Animal Model
 - All lactations included
 - +6 to PTA CD & MCD



Calving Performance – Nov07

- Means/Std Dev AI bulls

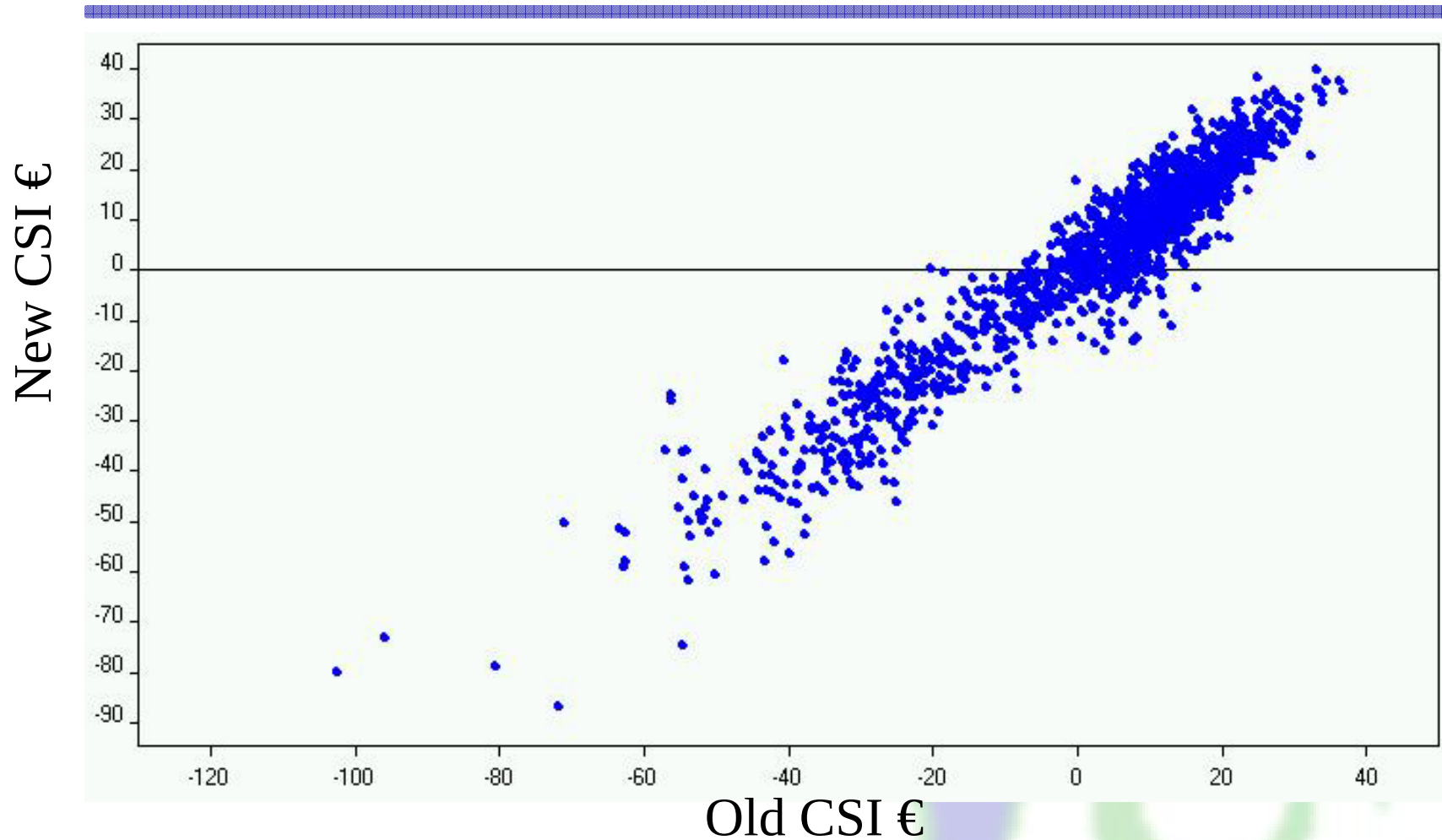
	CD	MCD	GEST	MORT	CSI
New	-1.69/3.3	2.4/2.4	-0.16/1.99	-0.07/0.6	2.6/19
Old	-1.63/3.4	2.6/2.6	-0.17/1.86	-0.07/0.7	2.3/19

- Correlation to previous proofs

CD	MCD	GEST	MORT	CSI
0.91	0.87	0.95	0.8	0.95

- Reliability increased by ~15%

Calving Performance



4. Calving Performance

- Further Work
 - Heifer vs later parities
 - Initial work suggest a correlation of 0.70.
 - Available on a “research” basis (easy-calving sires)?
 - Use of historical data
 - Interbull test run (Sept 08) – information for foreign bulls for Jan 09

5. Linear Type Proofs – Nov07

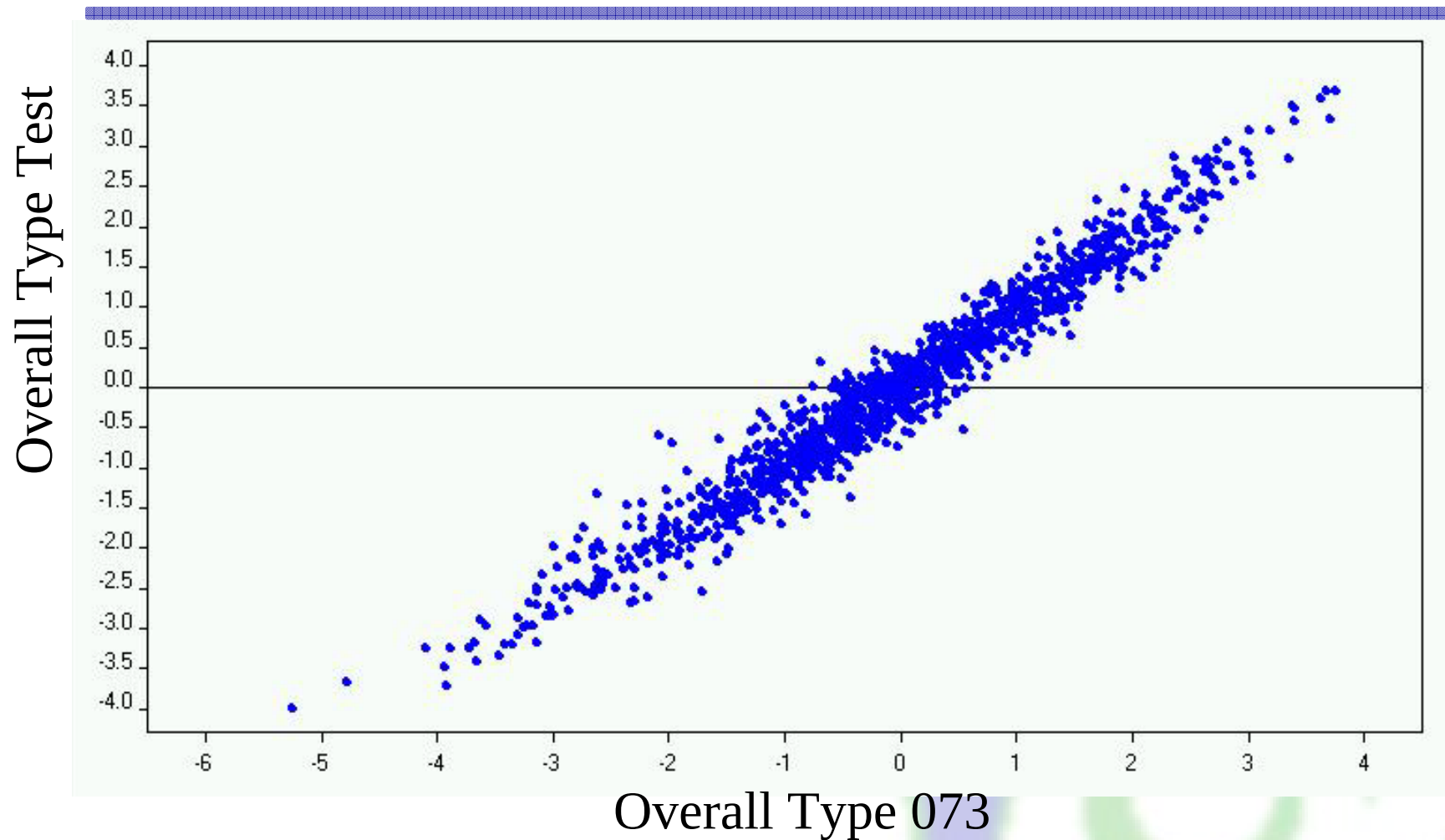
- Spring 2008
 - New definition of Overall Type

	Dairy Strength	Feet & Legs	Mammary	Rump	Body
Old TM	25	25	40	10	0
New TM	0	35	40	0	25

$$\text{Body} = 0.974 \cdot \text{STA} + 0.184 \cdot \text{CW} - 1.060 \cdot \text{BD} - 0.545 \cdot \text{ANG} - 0.167 \cdot \text{RA} - 0.335 \cdot \text{RW}$$

- More emphasis on Feet & Legs
- Less on angularity & body depth
- Overall correlation 0.98
- See handout for individual bulls

Linear Type Proofs



5. Linear Type Proofs

- Future Work
 - Definition of Irish base and scale – options are currently being explored
 - Distributed to industry over next few months
 - Evaluations for non HF breeds

6. Across Breed Evaluations (i)

- Need proofs for other dairy breeds.
 - Black & white - Interbull
 - Monbelliarde - Interbull
- Breeds need to have ~ 20 AI bulls each with 80 daughters in 20 herds to be included in Interbull evaluations.
- Other breeds;
 - Interim approach required.
 - Conversion equations.

Conversion Equations

- *Need of a genetic link between countries*
- *Use of multi regression model*

foreign proofs => Irish proof
(predictors) (predicted)

- *Allow the use of foreign proofs in Irish genetic evaluation output*
- *Transition before Interbull*

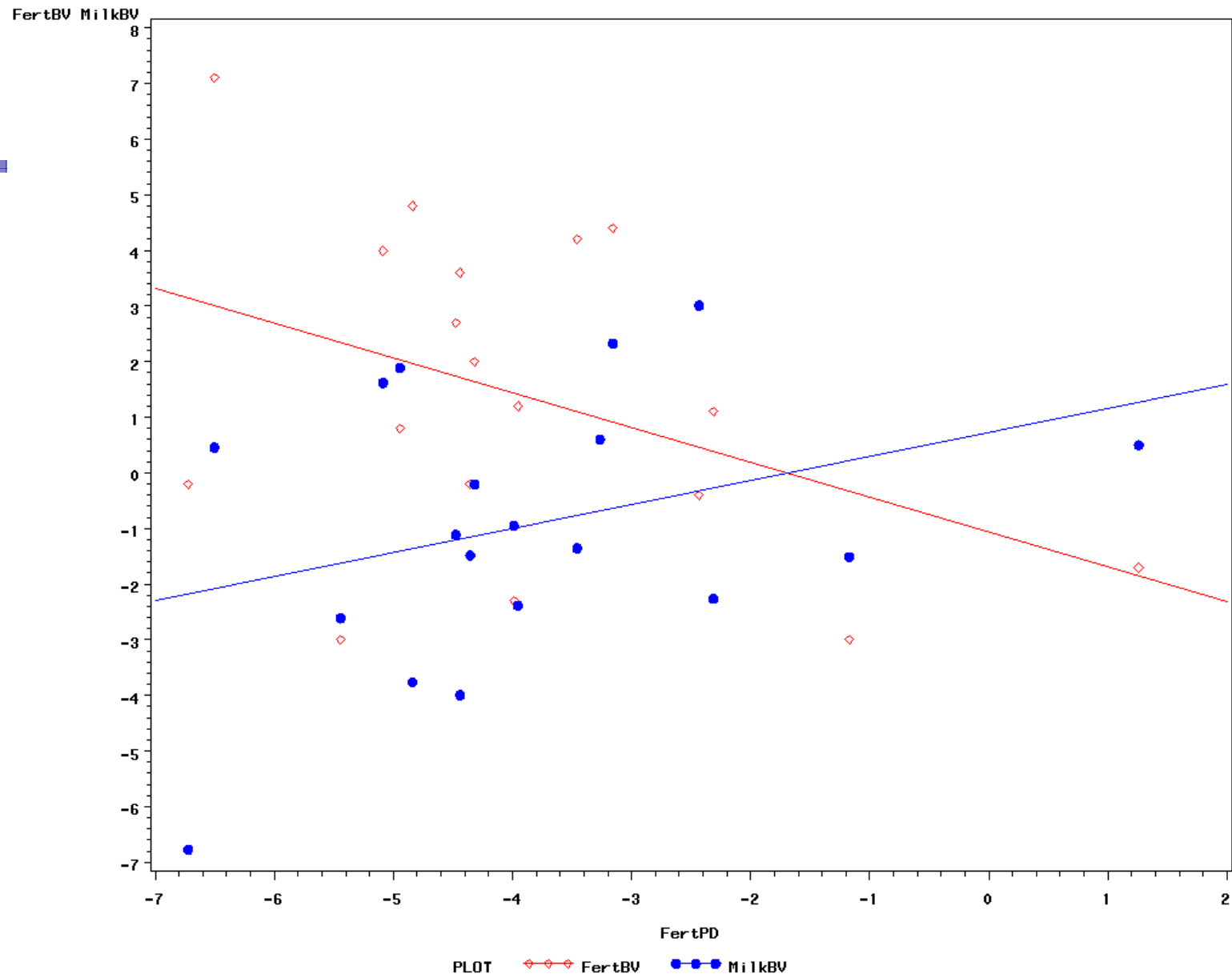
Conversion Equations

- *Jersey bulls from New-Zealand*
 - 62 ‘connecting’ bulls
 - *Converted traits*

	N	Rel _{IRL}	R ²	r _g
Milk	43	>50%	0.46	0.79
Prot.	43	>50%	0.41	0.75
Fat	36	>60%	0.51	0.81
SCC	22	>50%	0.31	0.67
Fert.	19	>40%	0.30	0.77
Long.	8	>40%	0.49	0.77

Multiple Correlation for FERTILITY Jersey

Significant variables $P < 0.15$
Reliability (%) > 0.40



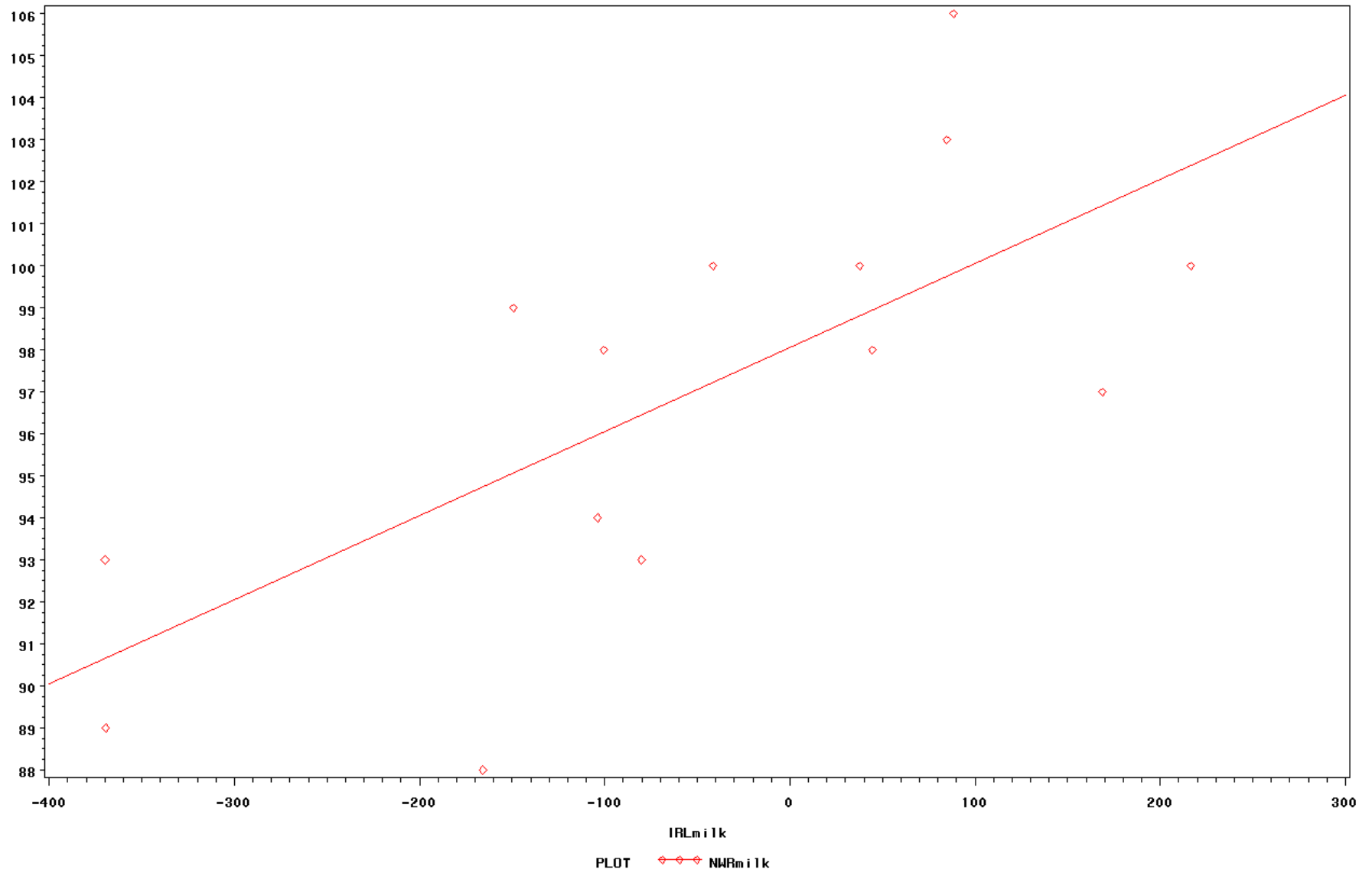
Conversion Equations

- *Norwegian Red bulls from Norway (in progress)*
 - 36 'connecting' bulls
 - *Converted traits*

	N	Rel _{IRL}	R ²	r _g
Milk	14	>60%	0.49	0.74
Prot.	13	>80%	0.32	0.60
Fat	14	>70%	0.56	0.80
SCC	12	>60%	0.46	0.79
Fert.	14	>20%	0.49	0.70
Long.	-	-	-	-

Multiple Correlation for MILK NorwegianRed

Significant variables $P < 0.15$
Reliability (%) > 0.6



6. Across Breed Evaluations (ii)

- Important to have accurate evaluations for all dairy breeds.
- Defining genetic groups
 - (a) Criteria for inclusion of a breed on its own: records in evaluation, connectedness
 - (b) Criteria for grouping breeds together
e.g. Scandinavian Red Breeds
- Correction for heterosis

Incorporating specific effects for more numerous crosses

6. Across Breed Evaluations (ii)

Table 7. Estimates of hybrid vigor effects for EBI traits

Traits	EV's	0%	25%	50%	75%	100%
Milk	-€0.09	0	-4	57	77	93
F kg	€1.26	0	0	2	3	4
P kg	€6.91	0	0	2	3	3
CI	-€11.97	0	-0.6	-0.7	-0.8	-0.8
SURV	€11.17	0	-0.4	0.4	1.2	2.2
€-value		€0	€4	€24	€38	€51

- Value of Cross-breeding now being quantified based on Irish data.
- All “other breeds” currently grouped together.

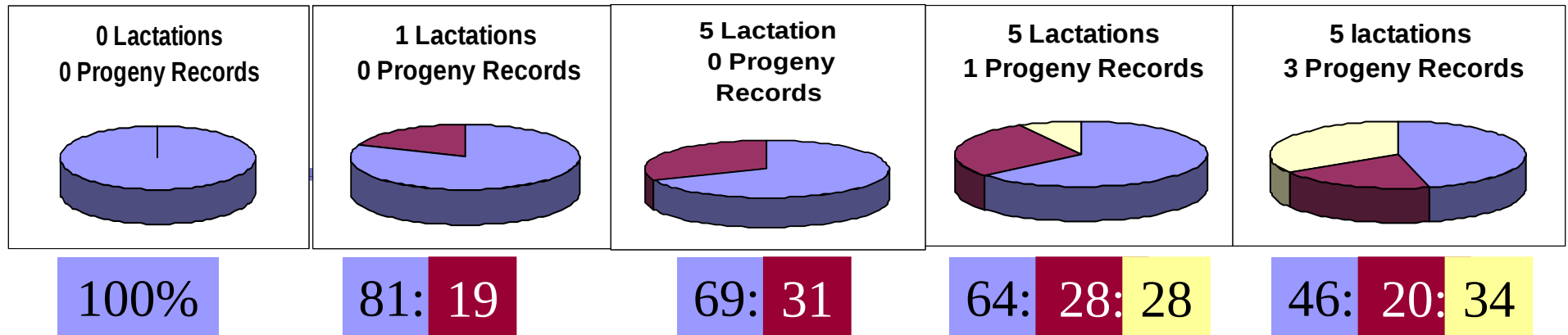
Standard Approach for all Traits

- Milk Production Evaluation
 - (a) Mathijs van Pelt – NRS testing on milk production evaluation*
 - (b) N.L. Villalobos Massey – testing on milk production evaluation and Norwegian Red study*
- Fertility, Calving, Beef
 - Testing being undertaken in ICBF*
- End result:
 - More informed information for sire advice*

7. Production Worth/Value

- EBI ranks a cow on her expected ability to breed profitable and efficient replacements
- Production worth tells more about cows own ability: measure of the lifetime producing ability of the cow herself
Breeding Value + hybrid vigour + permanent environment
(a permanent environmental effect could be a cow with only 3 spins)
- Different Time-frame to EBI
 - *EBI: 10-15 years projection of EVs*
 - *PW: EVs calculated over lifetime of cow*
- Weighting placed on cows own records is much greater than ancestry/progeny
 - *Comparable across herds, ages and breeds*
 - *Useful for culling decisions*

EBI: weighting of ancestry/own perf/progeny

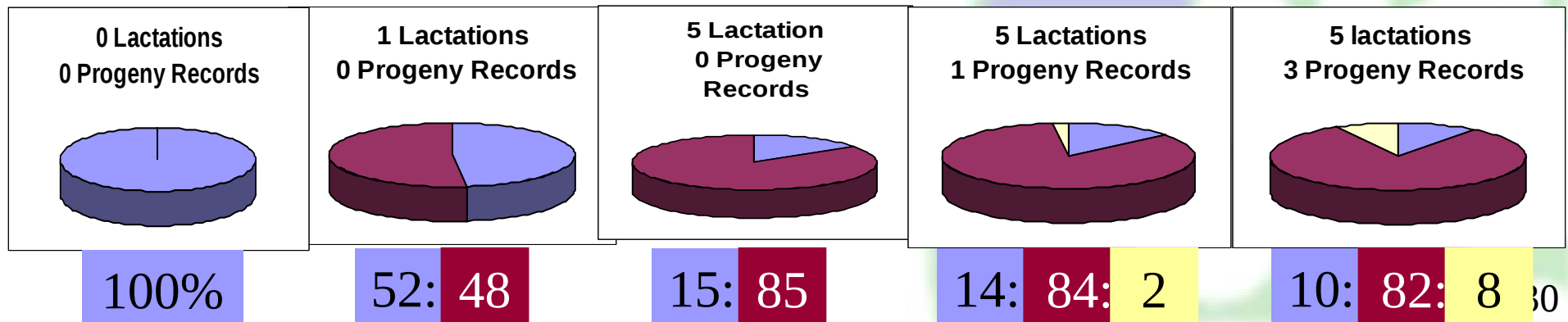


Ancestry information

Own Lactation

Progeny Information

Production Worth: weighting of ancestry/own perf/progeny



8. Calf Quality

- Access to “drop-calf” data from marts.
 - Price on the day is an indicator of calf quality (conformation).
 - Evidence of differences between sires in prices of their calves (~€50).
 - Important implications for both dairy & beef sires.
- Review inclusion of this trait in EBI
 - More reflective of profit than evaluating sires based on slaughter data?
 - Most dairy farmers do not see “slaughter value”

Example – *Mart Data.*

- Contemporary group 5 animals or greater
- Calves up to 42 days of age
- Price per calf available, no calf weight
- Sold as individuals
- Years 2002 to 2006
- Further data & analysis required.

Breed	Raw (HO dam)	No
FR	€168	1453
HO	€160	20108
JE	€89	209
MO	€228	210
AA	€210	4144
BB	€297	1590
CH	€284	257
LM	€237	548

9. Farmer Management Traits

- **Farmer satisfaction**
 - Genetic variation present
 - Uncertainty of correlation with fertility
 - Increase level of recording;
 - GENE IRELAND & ICBF HerdPlus Herds.
- **Electronic DIY milk meters**
 - Milking speed
 - Temperament ?
 - Milk flow ?

Other Issues of Interest?

- ■



ICBF Active Bull List (08).

- Bull List; published next week.
- Availability of certain bulls; major frustration for farmers. Credibility of list & sire advice?
- Sire Advice 2008; Will only consider medium & high availability bulls.
- Going forward (Autumn 2008)
 - New system for recording semen levels/bull.
 - Recorded by AI company.
 - Linked to Active Bull List & Sire Advice system.
- Retrospective analysis; availability vs. semen used & no. calves on ground.

Publication of proofs.

- ***Concern has been expressed as to why AI organisations have to wait longer than other countries for official proofs?***
- Proofs were published on time (8th February) – date communicated on ICBF update 4th Jan.
- In addition, *unofficial proofs* were published for AI sires on 29th January.
- Proofs were received from Interbull on 14th January.
- Why the delay?

Why are we different?

1. ICBF is a “central” cattle breeding organisation.
 - AI orgs, Herdbooks, MR orgs & farmers.
 - Objective with proof publication; (i) meet the needs of all shareholders, (ii) do the process once!
2. ICBF & DAF databases *(data extract)*
 - New herds & animals are continuously getting involved in ICBF database.
 - Another 30k herds from Suckler scheme.
 - Farmers adding “missing sires” to animals.
 - We must take a “full extract” of data each time.
 - Most other countries (stable populations) can take an extract of just the new animals.

Why are we different?

3. Range of breeds & traits (*genetic evaluations*).

- ICBF produce genetic evaluations for all breeds (dairy & beef) – 30 breeds (including cross-breeds) & 13 million animals in total.
- ICBF produce genetic evaluations for some 70 traits & 10 economic indexes.
- Complexity of models, number of traits & animals means that this can take longer than in some other countries

Why are we different?

4. Publication of proofs *(data loading)*.
- Must load data for a large range of animals & traits.
 - Must then “fill the blanks” for animals without records (based on parent average)
 - All young-stock (all traits).
 - Calving & beef proofs for imported AI sires – the “unofficial” proof extract.
 - Must then calculate economic indexes for all animals (based on traits).
 - Do it once (all shareholders) & do it right!

Why are we different?

5. A number of exceptional changes this time;

- Changes to dairy evaluations.
 - New EV for EBI.
 - New AM proofs for calving & beef (as opposed to parent averages).
 - New base (calving performance)
- Delay in receiving Interbull proofs.
 - Problems with a number of countries.

Problems do still happen!

- A small number of AI sires (& cows) were still missing calving & beef proofs.
 - Missing ancestry (& parent ave).
- Maternal weaning weight.
 - Still not happy with new maternal weaning weight evaluations.
 - Beef proofs “on hold”
 - Due for release tomorrow (15th Feb).

Summary.

- We acknowledge the frustration of AI companies who want to get proofs for AI catalogues.
- However, we do feel that we are providing a full & complete service (breeds & traits) to the cattle breeding industry.
- This is reflected in the uptake in AI & EBI within the industry.....
- ***We are always seeking to improve.***

Plans for 2008

- Interbull runs
 - Mid/late April.
 - Mid/late August.
- Additional domestic run.
 - Mid/late October.
 - Key time for beef proofs (AI & HB sales).
 - Opportunity to update all changes into database systems ahead of Feb 2009.