



IRISH CATTLE BREEDING FEDERATION

ICBF Dairy Industry Meeting.

Teagasc, Moorepark
23rd November 2007.

Agenda

- Changes proposed for Nov/Dec 2007
 - EBI Developments – Laurence Shalloo.
 - Updating calving performance - Francis Kearney
 - Updating linear type proofs – Francis Kearney
 - Roll-out of proofs & plans for 2008
- For Information
 - Improving female fertility evaluations – Kate Twomey (*Donagh Berry*)
 - Use of insemination data.
 - Across breed proofs – Ross Evans.
- Any other business

EBI Development

Overview

- Milk price assumption
- Sensitivity around feed prices

Review 2007

- Quota to Land Limiting
- Protein to fat value increased from 2 to 1 to 2.7
to 1

Update all costs and Prices

- Many changes have occurred to predicted prices in 2007;
 - Milk price
 - Grain price
- Some of reasons for these changes;
 - Biofuels
 - Global warmingAustralia
 - Demand for dairy products

Assumptions for 2008

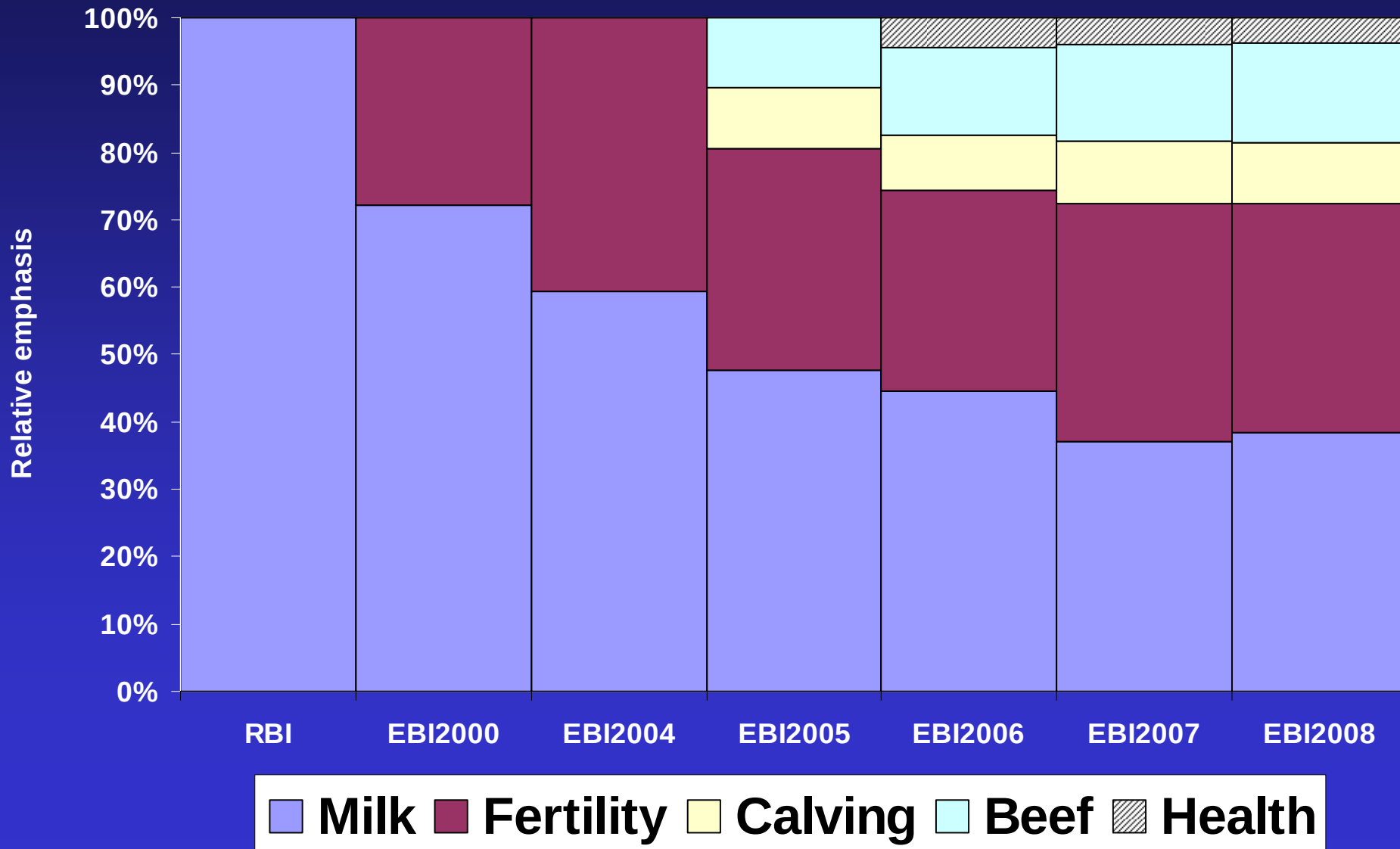
- All costs and prices
- Concentrate costs at €250/tonneDM
- Opportunity cost of land €500/Ha
- Milk price
 - 28c/l

		Index			
		Current	26c/l	28c/l	30c/l
Milk Yield	➡	-0.085	-0.09	-0.09	-0.09
Fat Yield	➡	0.96	0.92	1.09	1.26
Protein Yield	➡	5.36	6.05	6.48	6.91
CIV	➡	-10.87	-11.83	-11.9	-11.97
Survival	➡	10.51	10.31	10.74	11.17
Direct CD	➡	-3.26	-3.56	-3.6	-3.65
Maternal CD		-1.73	-1.73	-1.73	-1.73
Gestation	➡	-6.8	-7.5	-7.5	-7.5
Calf mortality		-2.85	-2.85	-2.85	-2.85
Cow Wt		0.04	-0.51	-0.51	-0.51
Carcass weight		1.38	1.38	1.38	1.38
Carcass conformation		10.32	10.32	10.32	10.32
Carcass fat		-11.71	-11.71	-11.71	-11.71
Somatic cell count	➡	-55.48	-56.42	-56.89	-57.21
Locomotion	➡	1.13	1.13	1.13	1.13

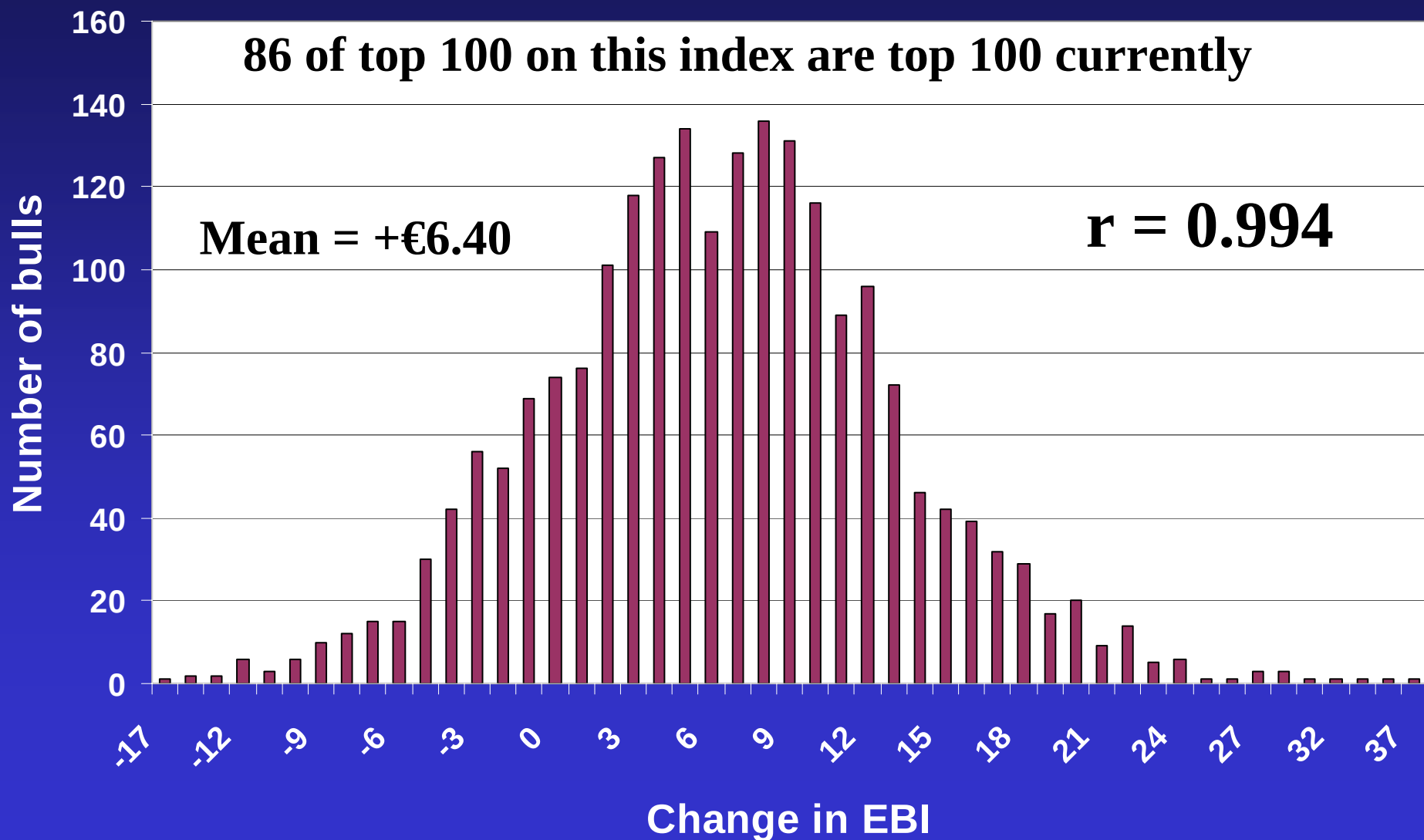
Cull cow

- Revenue → more carcase and higher price
 - No change
- Feed costs based on land limitng
 - Costs → growth & maintenance
 - Feed costs increased to €176/tDM
 - Feed costs €0.163/UFL
- Old economic weight = +€0.04
- New economic weight = -€0.513

Relative emphasis – 28 c/l



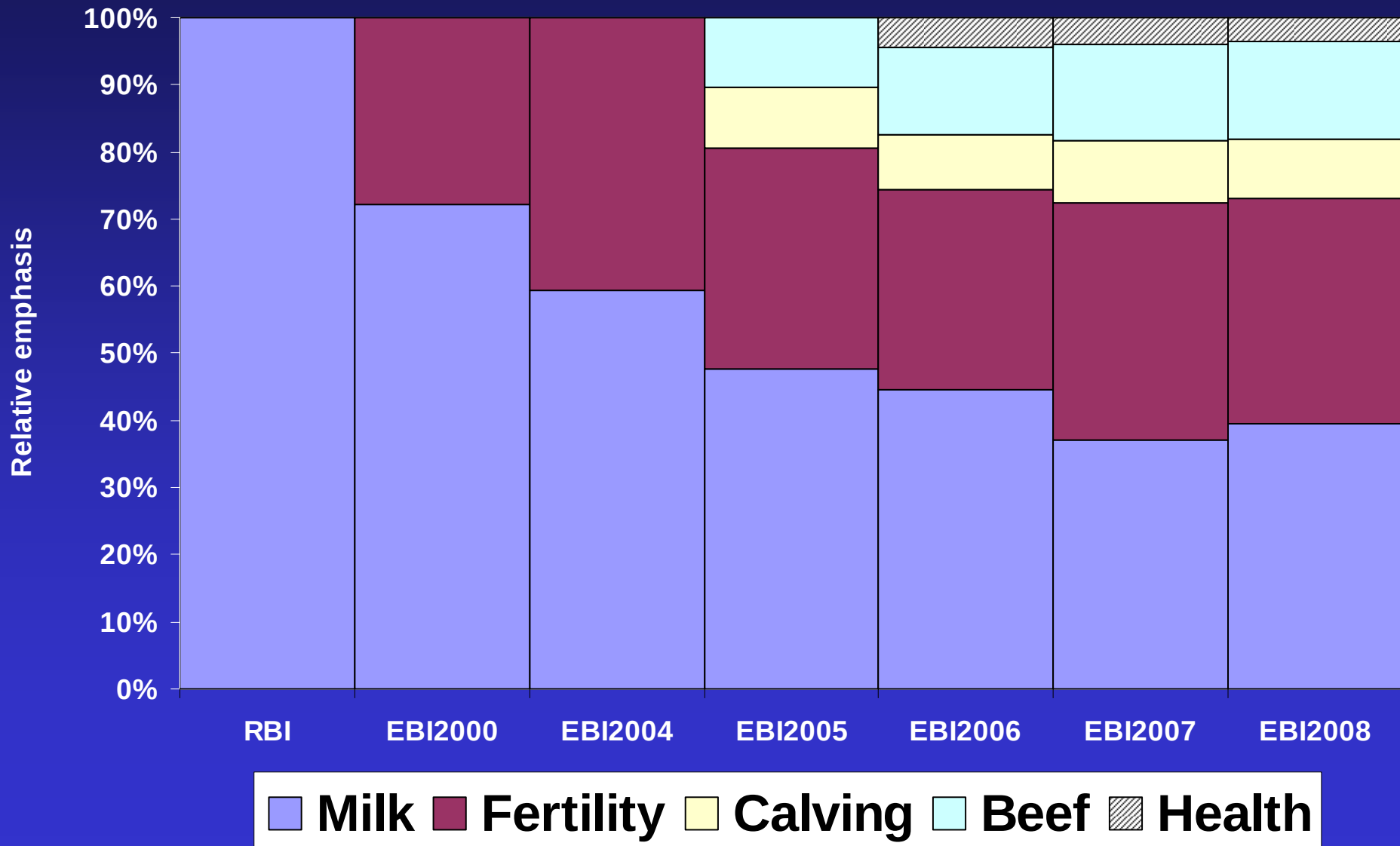
Impact on sire-proofs (n=2100; 28c/l)



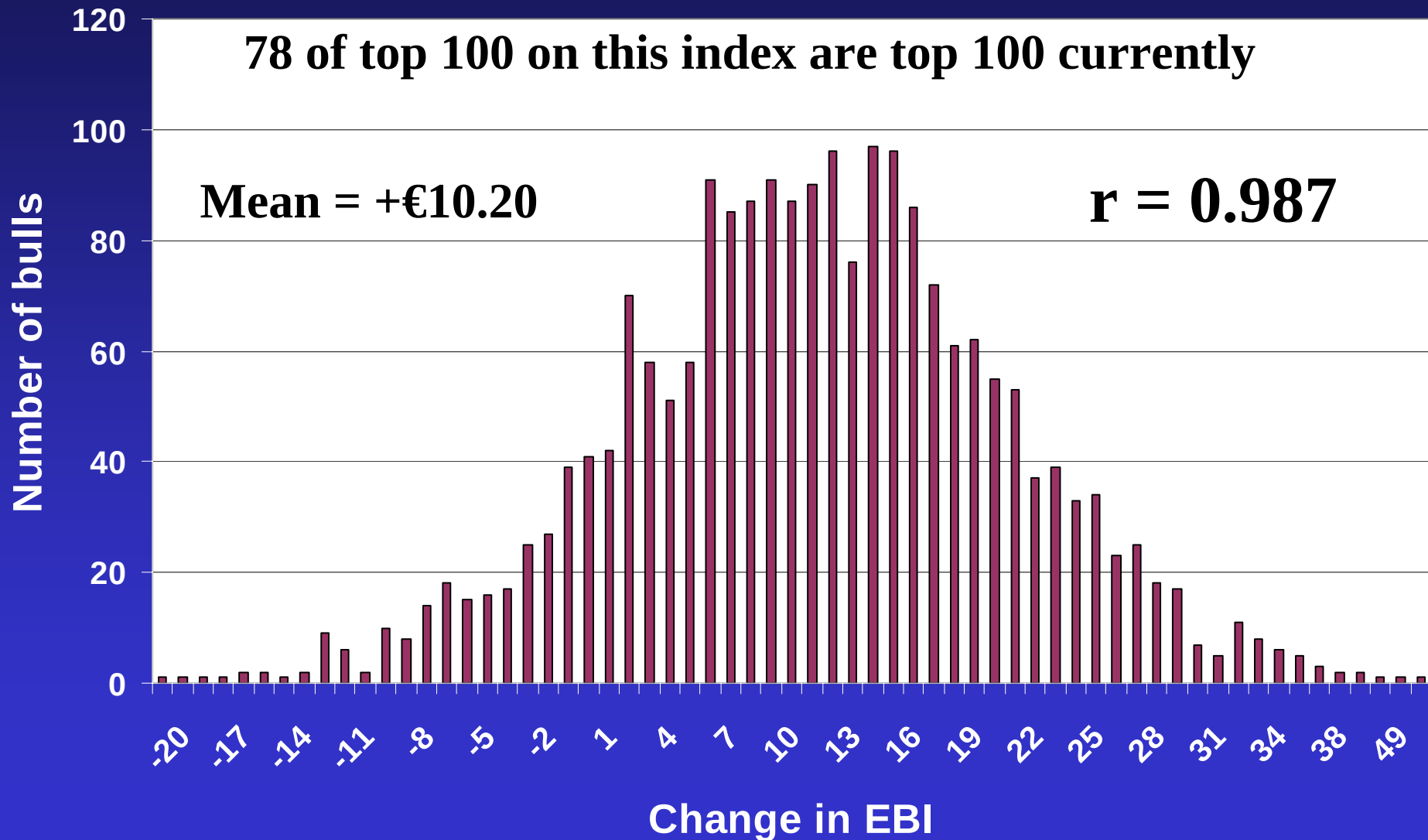
Top 75 bulls – 28 c/l

Trait	Mean	Minimum	Maximum
Milk Yield	54	-445	637
Fat Yield	10	-10	26
Protein Yield	6	-9	21
CIV	-4.6	-8.7	-0.1
Survival	2.6	0.6	6.8
Direct CD	-3.8	-5.2	1.4
Maternal CD	4.6	-2.1	10.1
Gestation	-1.6	-4.2	2.5
Calf mortality	-0.5	-2.0	0.9
Cow Wt	-3	-40	19
Carcass weight	-4	-48	17
Carcass conformation	-0.35	-1.17	0.75
Carcass fat	0.02	-0.68	0.94
Somatic cell count	0.01	-0.23	0.22
Locomotion	-0.12	-2.10	2.14

Relative emphasis – 30 c/l



Impact on sire-proofs (n=2100; 30 c/l)



Top 75 bulls – 30 c/l

Trait	Mean	Minimum	Maximum
Milk Yield	94	-445	637
Fat Yield	11	-10	26
Protein Yield	8	-5	21
CIV	-4.3	-8.7	-0.1
Survival	2.5	0.0	6.8
Direct CD	-3.8	-5.2	1.4
Maternal CD	4.6	-2.1	10.1
Gestation	-1.6	-4.2	2.5
Calf mortality	-0.6	-2.0	0.9
Cow Wt	-3	-40	15
Carcass weight	-4	-48	15
Carcass conformation	-0.39	-1.17	0.75
Carcass fat	0.02	-0.68	0.94
Somatic cell count	0.01	-0.23	0.22
Locomotion	-0.13	-2.10	2.14

Feed costs

- Concentrate at €250/tonneDM or €0.223/UFL
- First cut grass silage costs €127/tonne DM or €0.158/UFL
- Second cut grass silage costs €142/tonne DM or
€0.184/UFL
- Maize silage costs €130/tonne DM or €0.163/UFL

Sensitivity around feed costs

Sensitivity

- €125/t DM €0.116/UFL
- €150/t DM €0.139/UFL
- €175/t DM €0.162/UFL
- €200/t DM €0.185/UFL
- €225/t DM €0.203/UFL
- €250/t DM €0.231/UFL

Feed cost variation at 28c/l milk price

	Feed Input Costs €/T	175	125	150	200	225	250
Yield	Protein	6.48	6.724	6.604	6.364	6.26	6.13
	Fat	1.09	1.604	1.355	0.858	0.610	0.361
	Milk	-0.09	-0.081	-0.086	-0.095	-0.099	-0.104
Fertility	Survival	10.74	12.13	11.46	10.17	9.45	8.776
	Calving Interval	-11.90	-8.64	-10.21	-13.37	-14.94	-16.52
Beef	Cow carcass wgt	-0.51	-0.151	-0.328	-0.667	-0.842	-1.011

Feed cost variation at 30c/l milk price

	Feed Input Costs €/T	175	125	150	200	225	250
Yield	Milk	-0.09	-0.081	-0.086	-0.094	-0.099	-0.103
	Fat	1.257	1.772	1.523	1.026	0.777	0.528
	Protein	6.912	7.160	7.040	6.801	6.681	6.561
Fertility	Survival	11.17	12.56	11.89	10.55	9.880	9.210
	Calving Interval	-11.97	-8.71	-10.28	-13.44	-15.02	-16.59
Beef	Cow carcass wgt	-0.51	-0.151	-0.328	-0.667	-0.842	-1.011

Recommendation

- Little effect on economic values
- Economic value for live-weight is negative
- 28c/l milk price projection
- Update feed costs

Calving Performance

- Switching to new software and new model
- Include more data ($>5^{\text{th}}$ lact) and evaluations on both males and females
 - Increase reliability
- Also looking at heifers v later lactations

Calving Performance

- Means/Std Dev AI bulls

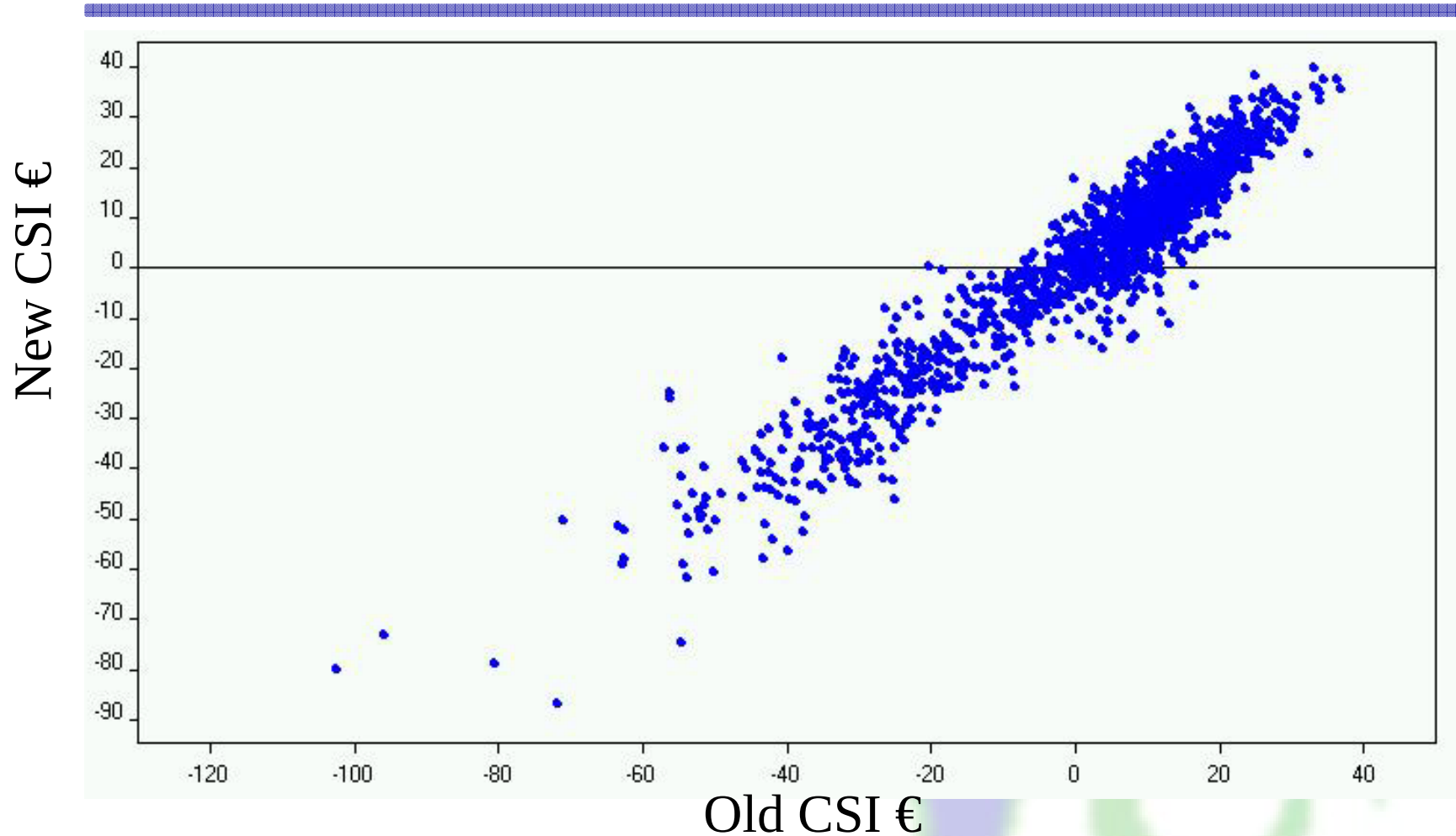
	CD	MCD	GEST	MORT	CSI
New	-1.69/3.3	2.4/2.4	-0.16/1.99	-0.07/0.6	2.6/19
Old	-1.63/3.4	2.6/2.6	-0.17/1.86	-0.07/0.7	2.3/19

- 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



Calving Performance

- Initial analysis of first vs later lactations
 - Correlation of 0.8
 - More work is need before any implementation
 - Genetic paramaters
 - Publication options?



Publication

- Currently expressed as PTA with range from -6 to +30
- For beef decided to always express CD & MCD as positive figure
 - 6 added to PTA after subindex calculated
 - Intuitively easier to understand
- In order to be consistent, propose to do the same with the dairy proofs
 - Easiest calving bulls would be around 0%
- Con - in order to construct calving SI need to subtract 6 from CD and MCD before applying economic value

Calving Performance

- Summary
 - High correlations
 - Higher reliability
 - Software provides much technical & operational advantages
- Recommendations
 - Move to new software for evaluation
 - Add 6 to PTA for CD and MCD
 - Continue work on 1st v later parity
 - Participate in Interbull as soon as possible

Linear Type Proofs

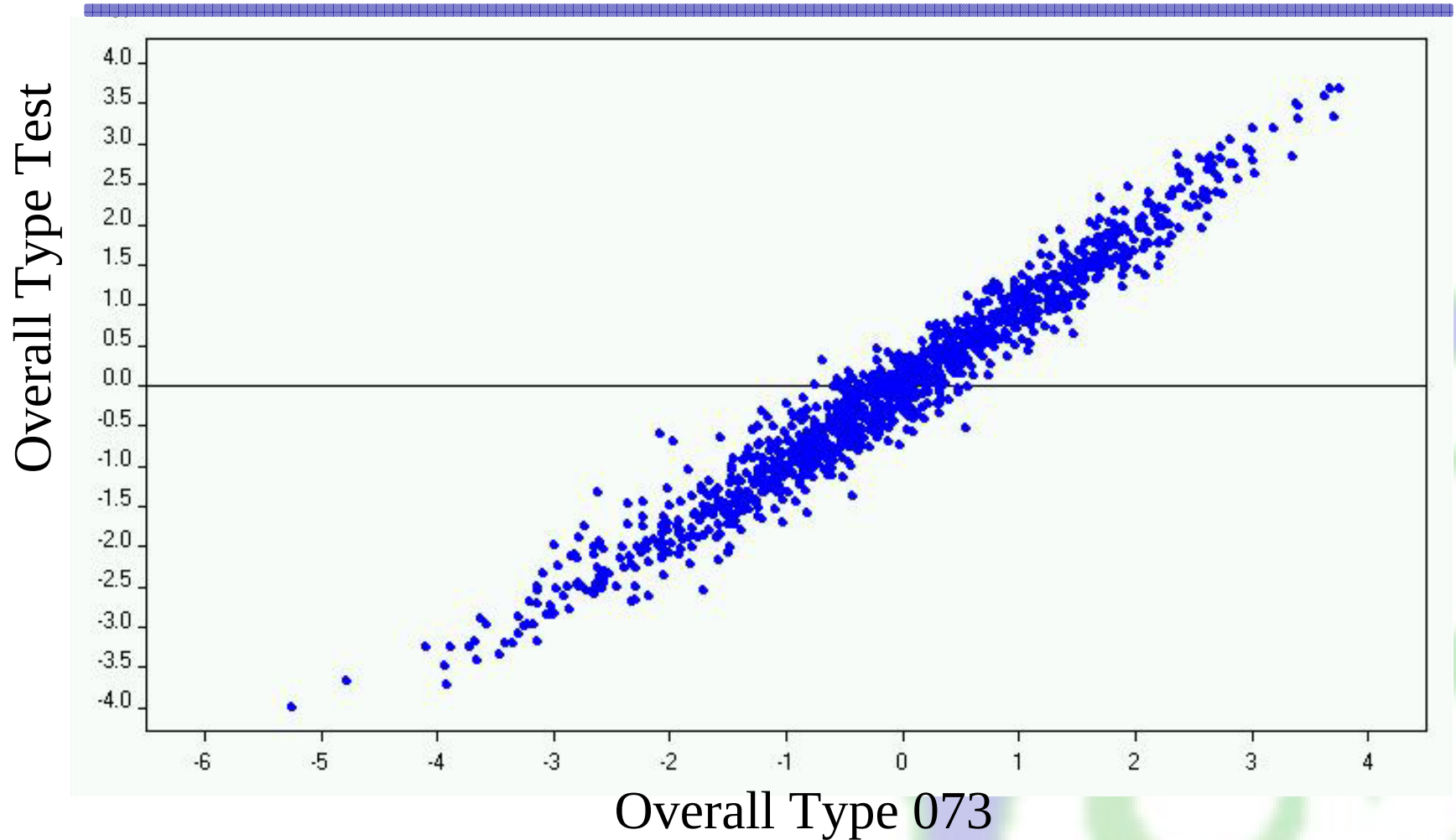
- New definition of Overall Type

	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



Linear Type Proofs

- New Irish base & scale also being investigated
- Based on bulls born 1989 to 1998 with
 - At least 20 Irish scored daughters or
 - At least 20% of daughter are Irish
- Results only obtained yesterday
- Too early to implement

Linear Type Proofs

- Recommendation
 - Move to new definition of overall type
 - Continue to investigate new base and scale

Roll-out of proofs.

- Agree proposed changes – today.
- Recommendations to ICBF board.
- Plan for official proof release;
 - Interbull evaluation - December 07
 - Further domestic evaluation (all traits) – January 07
 - Official proofs ~ 25th January 2008.

Fertility evaluations

Kate Twomey

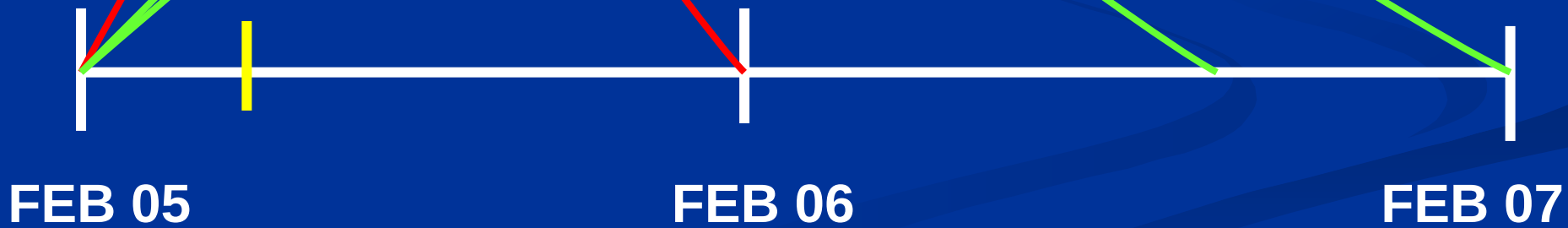
Objective

To use insemination data to identify cows that were bred in an attempt to calve within a year

Conscious
Decision?

Poor Fertility?

MATED



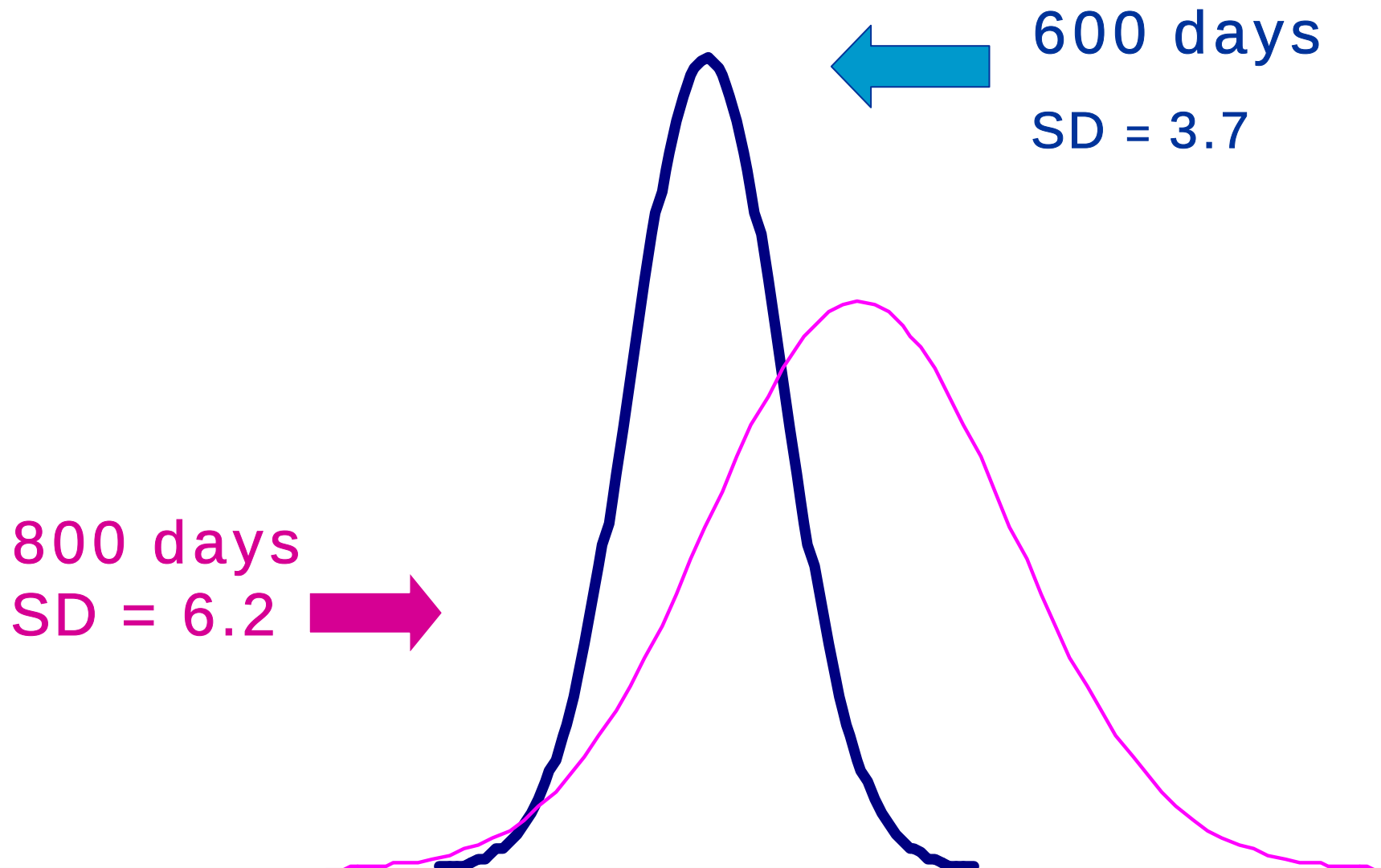
Data

- Data used were that included in national genetic evaluations
 - Parity 1 to 3
- Current situation
 - Calving interval >600 set to missing
- Proposal
 - If inseminated <150 days then include calving interval up to 800 days
 - If no insemination data or inseminated >150 then include data up to 600 days

Calving interval records

Parity	1	2	3
Current	805762	649783	502161
New (also including data between 600 and 800 days)	834794	671959	517301
Diff.	29032	22176	15140

Impact of edit on sire variation



Correlations between current CIV proofs and after edit

Correlation between all animals:

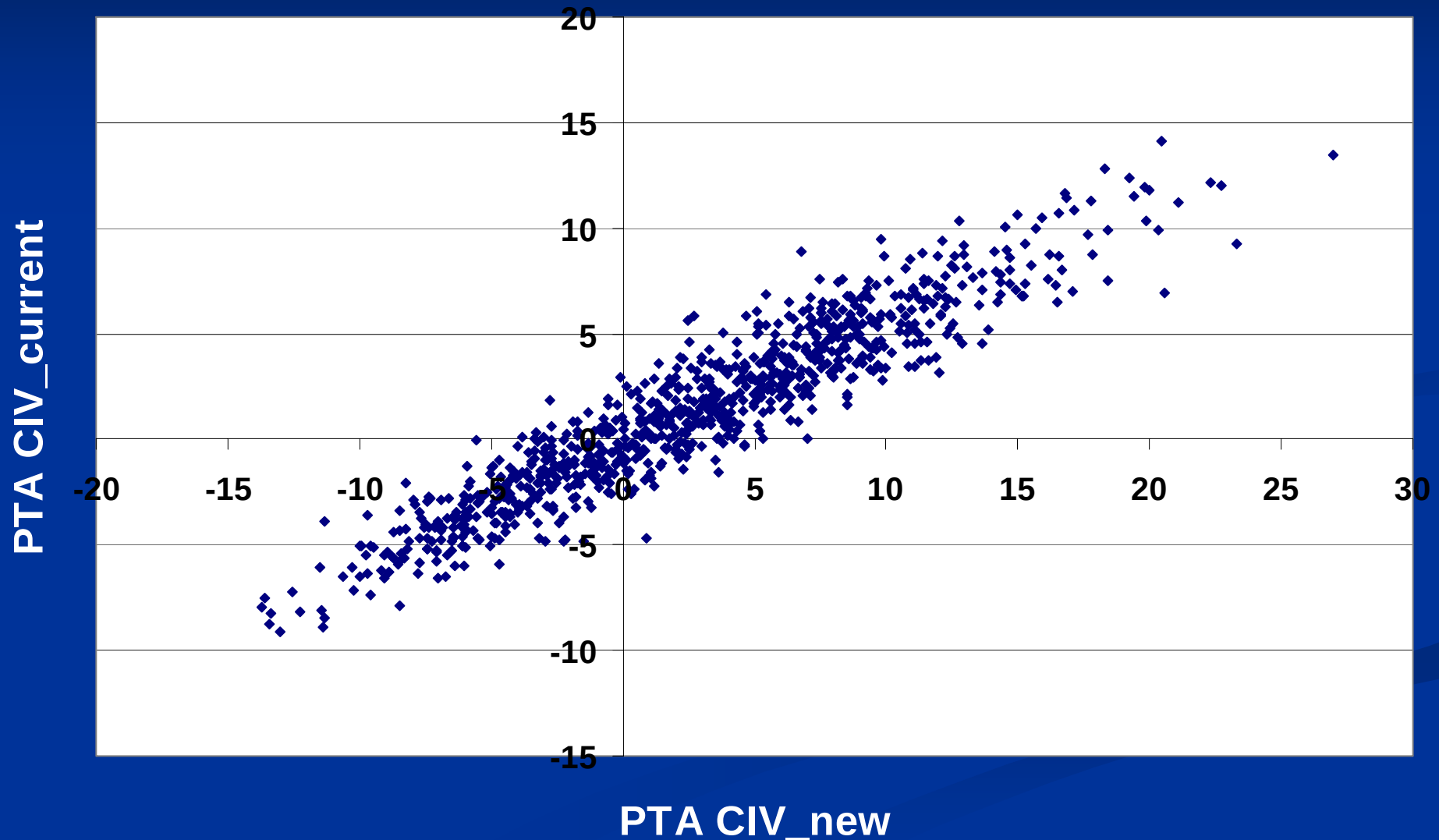
- Lactation 1 = 0.94
- Lactation 2 = 0.95
- Lactation 3 = 0.94

Correlation between AI sires:

- Lactation 1 = 0.93
- Lactation 2 = 0.94
- Lactation 3 = 0.93

Sire proofs

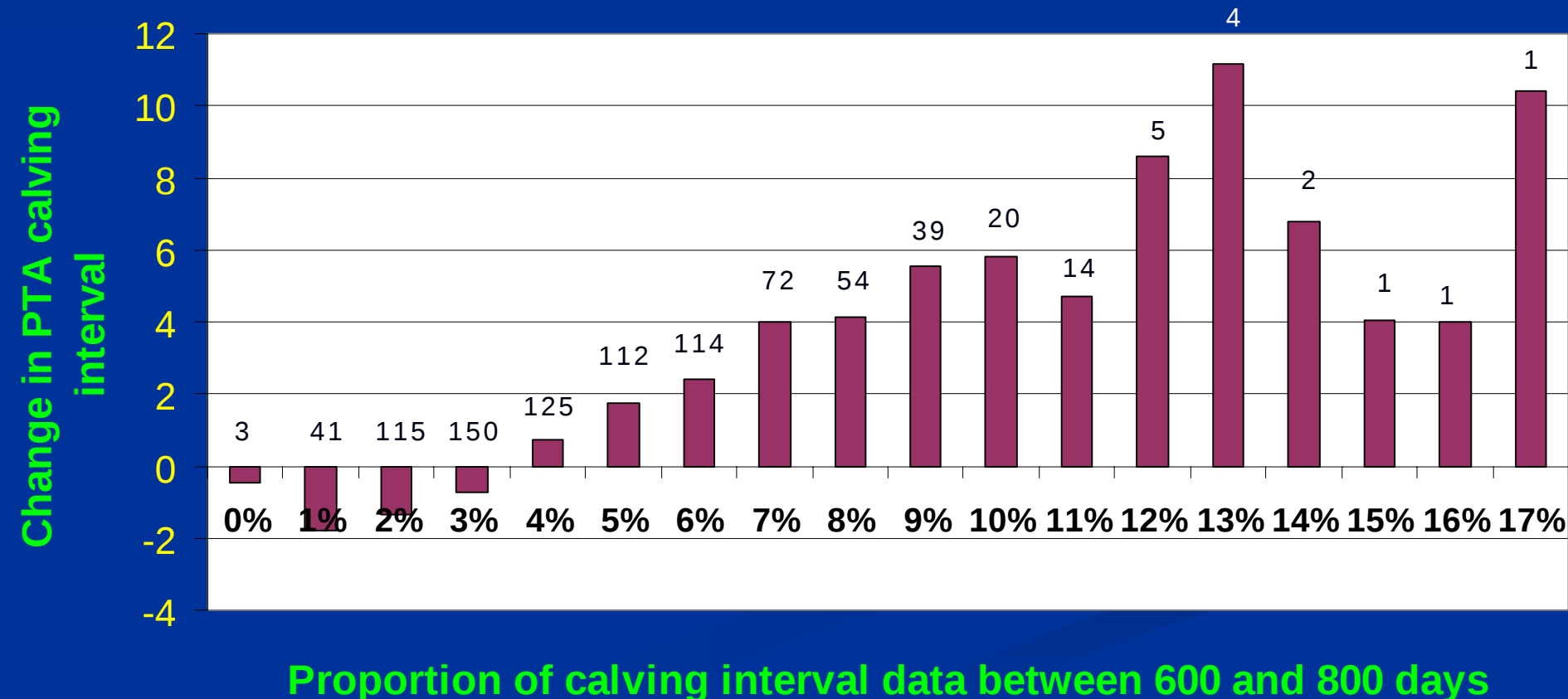
Current CIV proofs v. new CIV proofs



Change in sire CIV PTA

Lactation 1 (*similar results for lactation 2 & 3*)

Sire with >100 daughters (n=873)



Conclusions

- 3% more data by including data between 600 and 800 days
- EBVs more reflective of reality – penalises lower fertility bulls
- Future work – use calving to first service in multi-trait analysis



IRISH CATTLE BREEDING FEDERATION

Update on heterosis and handling of breeds in evaluations

Teagasc, Moorepark
23th November 2007

Background

- **Evaluations are now across breed for all traits**
- **Increase in numbers of predominant breeds and crosses between these breeds**
- **Differentiation of heterosis in different crosses**
- **Handling of minority breeds, grouping of breeds**
- **Previous meeting: Issue of how to handle missing fractions on animals**
- **Specific case of IHFA grade up herds**
 - **Action: examine the consequences of updating animals to all available breed information**

BALLYKINASH HWT LISA
IE-XRJZ-0113-X

Female

50% **Purebred** Registration
25% **Holstein** Grade: ASR
25% **Friesian**

Goes from 50% known
fraction to 94% known

JIM DELAHUNTY
BALLYKINASH CARRIG BIRR
CO TIPPERARY
050922119

Herd: IE3310189
Pedigree Index

Genetic Merit (PD) 30-SEP-2007
EBI Rel. Milk BF Ptn BF% Ptn%
105 45 36 10.5 6.0 0.18 0.09
Surv% CI Days O TY O FL O MA
1.8 -3.3 -1.9 -1.1 -1.5

Identified by Ear Tag Number:

IE-XRJZ-0113-X

Born: 20-FEB-1998

of issue: 22-NOV-2007

WERDA TORELLO

63319578265

Genetic Merit (PD) 30-SEP-2007
Rel. Milk kgs BF kgs Ptn kgs BF% Ptn%
97 -72 0.0 1.5 0.06 0.08
Surv% CI Days O TY O FL O MA
2.0 -4.2 -2.4 -1.1 -1.9

100% FR

JUPITER 161

63703688756

Genetic Merit (PD) 30-SEP-2007
EBI Rel. Milk kgs BF kgs Ptn kgs BF% Ptn%
89 34 -117 -5.0 -1.0 -0.01 0.06
Surv% CI Days O TY O FL O MA
1.6 -5.7

100% FR

JONICAAN 187

63001013235

EBI Rel. Milk kgs BF kgs Ptn kgs Surv% CI Days
16 10 -132 -4.0 -2.0 100%

NAATJE 323

63700039944

Body Dairy L&F Mam
Lact. Milk kgs Fat kgs Ptn kgs BF% Ptn% Days
4 35913 1442 1217 4.02 3.39 1214 100%

HOLWERDA AMAROZ

63311711211

EBI Rel. Milk kgs BF kgs Ptn kgs Surv% CI Days
61 23 -338 -4.0 -6.0 1.3 -4.6 100%

H JANKE 374

63313211922

Body Dairy L&F Mam
Lact. Milk kgs Fat kgs Ptn kgs BF% Ptn% Days
3 23977 1075 816 4.48 3.40 915 100%

Z-0008-U

Dairy 0 L&F 0 Mam 0
Genetic Merit (PD) 30-SEP-2007
Rel. Milk kgs BF kgs Ptn kgs BF% Ptn%
43 112 12.0 5.0 0.15 0.03
Surv% CI Days O TY O FL O MA
1.2 -2.6 -1.3 -1.1 -1.1

0

75% HO

12.5% FR

DOVEA NED BOY

0100542590

Genetic Merit (PD) 30-SEP-2007
EBI Rel. Milk kgs BF kgs Ptn kgs BF% Ptn%
73 98 168 7.5 6.0 0.02 0.01
Surv% CI Days O TY O FL O MA
0.1 -2.7 -0.8 -1.7

EX 90

100% HO

WHITTIERFARMS NED BOY

6301806201

EB Rel. Milk kgs BF kgs Ptn kgs Surv% CI Days
7 68 321 10.5 11.5 -0.9 3.0 100%

HEIDEMARIE

600180538

Body Dairy L&F Mam
Lact. Milk kgs Fat kgs Ptn kgs BF% Ptn% Days
4 31754 1425 1049 4.49 3.30 1220 100%

Milk kgs Fat kgs Ptn kgs BF% Ptn% Days
4879 204 174 4.17 3.56 285
4717 189 167 4.01 3.53 225
6328 266 229 4.20 3.61 286
5896 248 214 4.20 3.63 229
7672 322 291 4.20 3.79 290
Lifetime production
Milk kgs Fat kgs Ptn kgs BF% Ptn% Days
29492 1228 1074 4.16 3.64 1315

CLA-691449

Body Dairy L&F Mam

Genetic Merit (PD) 30-SEP-2007
Lact. Milk kgs Fat kgs Ptn kgs BF% Ptn% Days
3 4908 217 169 4.42 3.45 251
4 4941 217 171 4.39 3.45 245
5 5630 258 198 4.59 3.51 275
6 6071 246 214 4.05 3.53 299
7 5697 232 195 4.07 3.43 265
Lifetime production
6 31986 1374 1113 4.30 3.48 1578

75% HO

EB Rel. Milk kgs BF kgs Ptn kgs Surv% CI Days

Lact. Milk kgs Fat kgs Ptn kgs BF% Ptn% Days

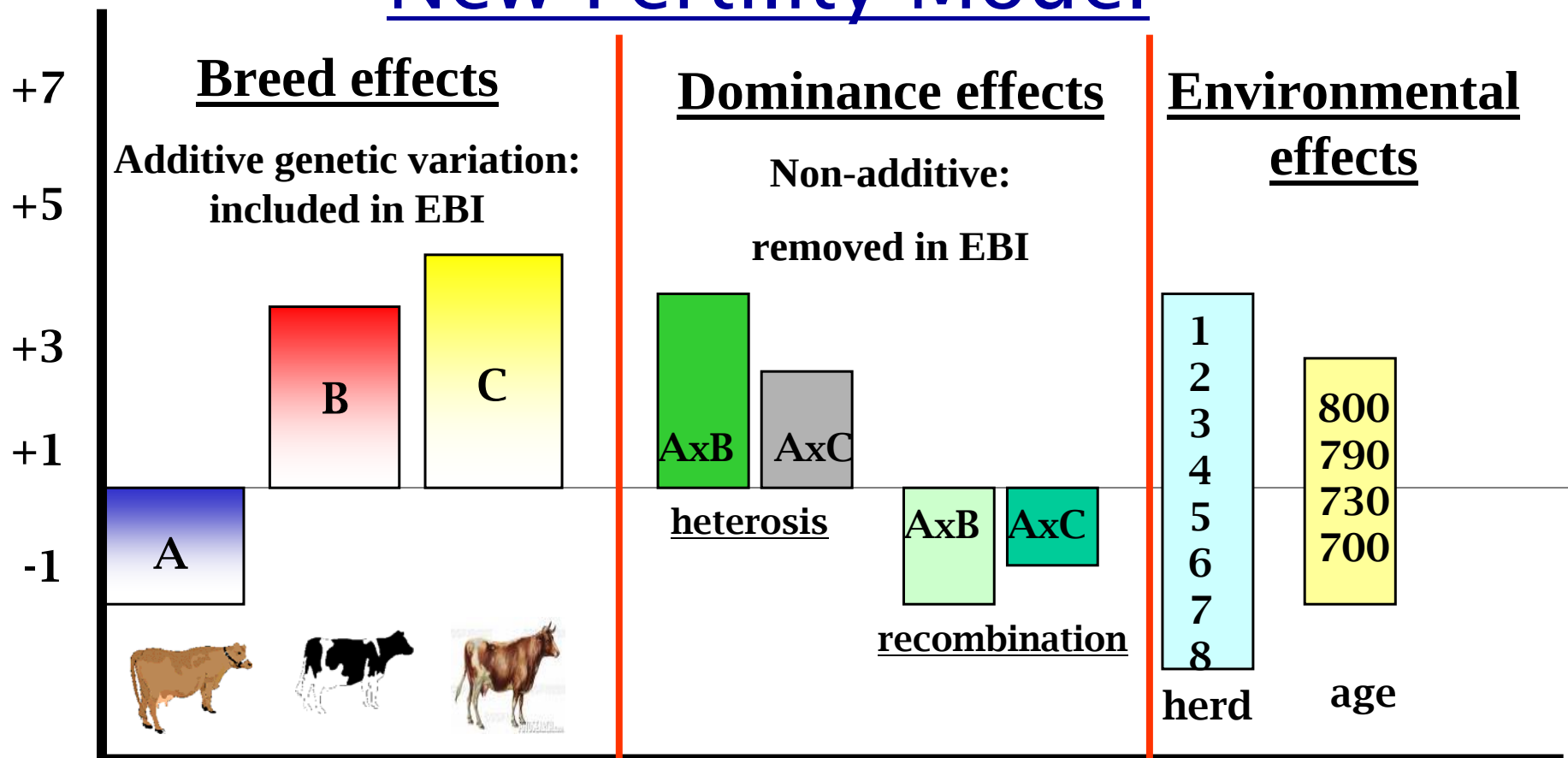
Lifetime production

Breed update: impact on categories of fractions known

	Before	After	Extra
All Animals in CIS Evaluation	1,147,199	1,147,199	
>66% of Breed Fraction Known	838,419	852,980	14,561
>75% of Breed Fraction Known	833,196	848,089	14,893
>87.5% of Breed Fraction Known	557,360	615,798	58,438
100% of Breed Fraction Known	373,350	377,465	4,115
			92,007

- These animals are updated for genetic evaluations
- 3 weeks to run breed fix on 12 million animals, done once a year
- Not updated on certificates or ICBF reports

New Fertility Model



Criteria for inclusion

Breed is represented
by at least 500 animal
equivalents :
i.e. 500 purebreds or
250 Purebreds + 500 F1 crosses
Remaining breeds are grouped

Criteria for inclusion

At least 500 crosses
between 2 breeds
At least 100 herds with
combinations of 1 or other
purebreds and crosses
Other crosses grouped

Criteria for inclusion

Current age and herd-
year season rules will
remain the same

Additive Breed Effects

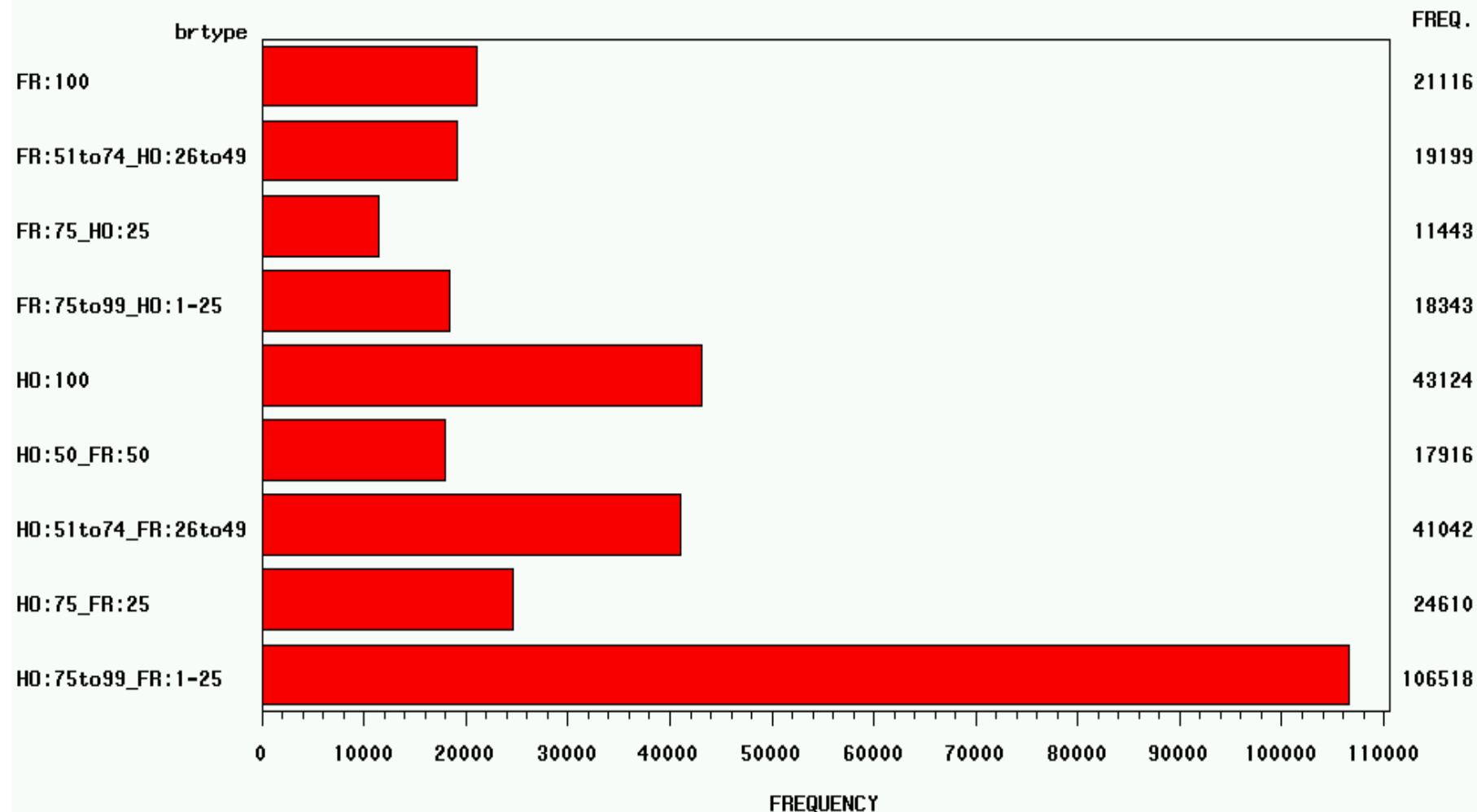
As handled in fertility evaluation

Primary breed	count	Current Evaluation	Proposal based on sum of all fractions	
Holstein	839062	Holstein	Holstein	622308
Friesian	280831	Red Holstein	Friesian	284054
Montbeliarde	9264	Friesian	Montbeliarde	7013
Jersey	3301	Montbeliarde	Jersey	2486
Meusse Rhine IJssel	2596	Jersey	Meusse Rhine IJssel	2172
Rotbunte	2122	Meusse Rhine IJssel	Rotbunte	1448
Simmental	1737	Rotbunte	Simmental	1229
Norwegian Red	899	Normande	Shorthorn	673
Shorthorn	897	Brown Swiss	Norwegian Red	636
Danish Red	692	Simmental	Ayrshire	438
Ayrshire	576	Shorthorn	Normande	418
Normande	573	Danish Red	Danish Red	369
Brown Swiss	416	Ayrshire	Red Holstein	343
Swedish Red	222	Norwegian Red	Brown Swiss	262
Red Holstein	218	Swedish Red	Swedish Red	123

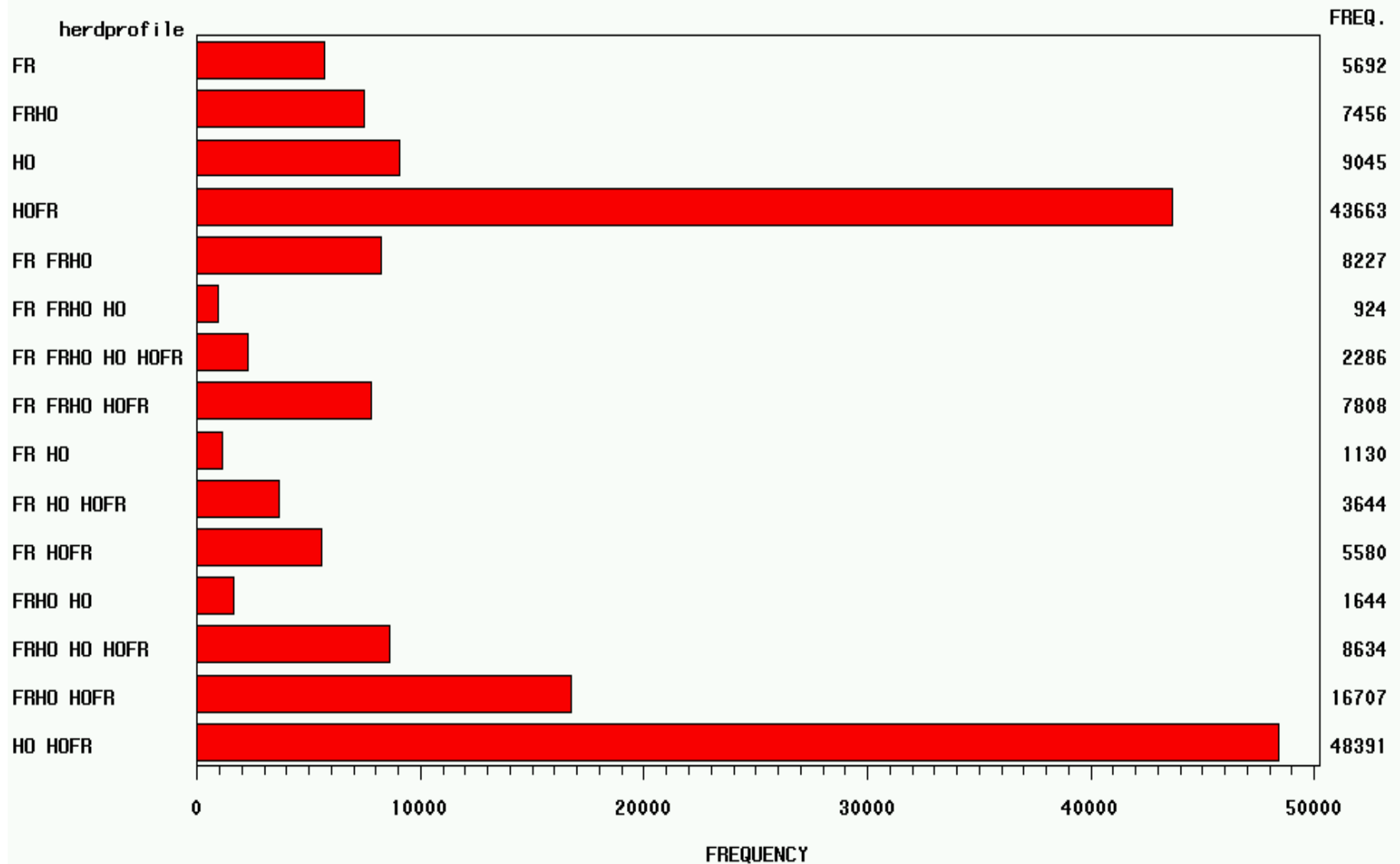
Non-Additive Dominance effects **(Heterosis & recombination)**

- **Criteria for inclusion of specific crosses**
- **Determine level of crossing between breeds in the evaluation**
 - **Sufficient crosses between 2 breeds in evaluation**
 - HO100%**
 - HO75% - FR25%**
 - HO50% - FR50%**
 - FR75% - HO25%**
 - FR100%**
- **Herd-year-seasons with purebreds and crosses between two breeds gives best information**

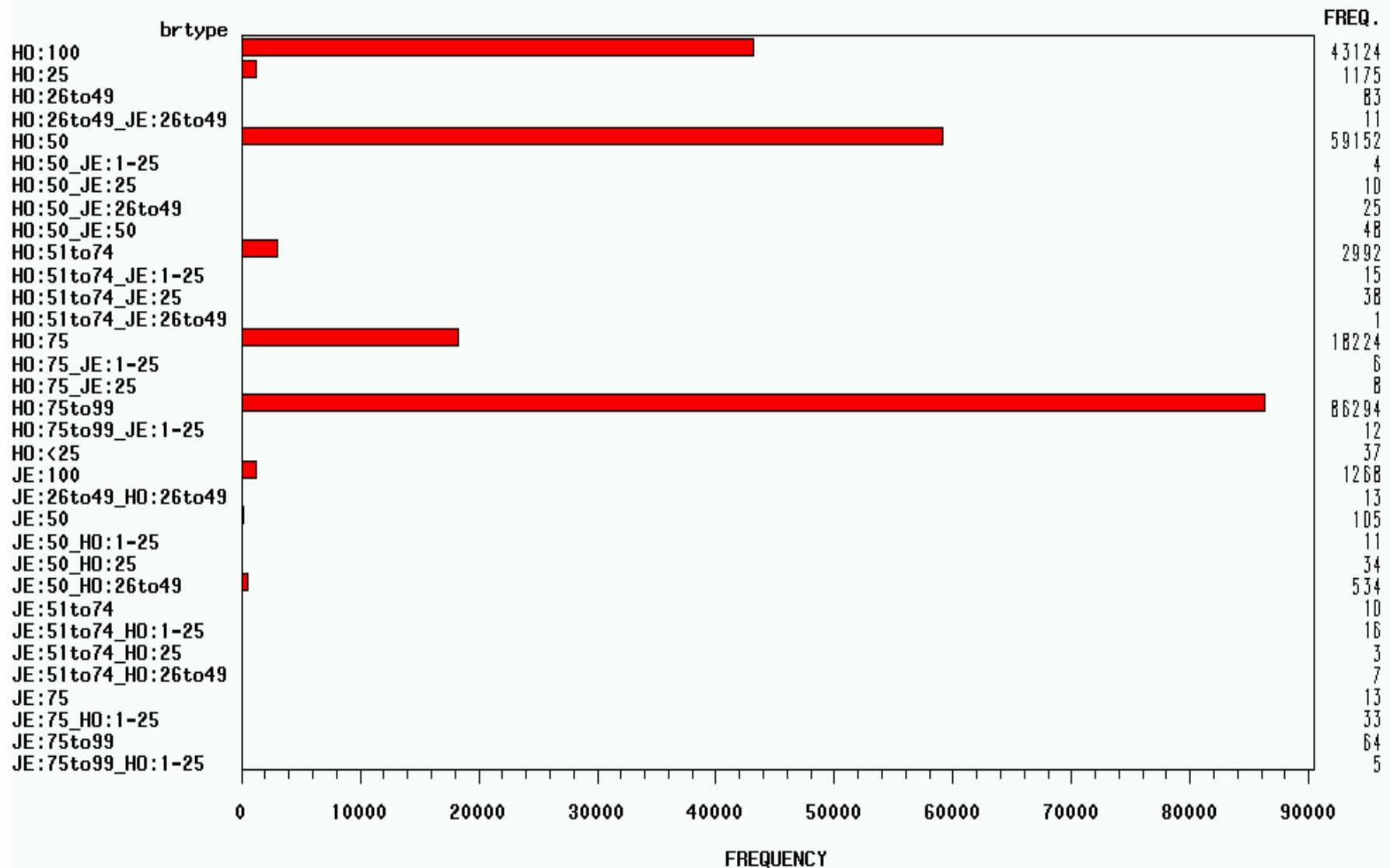
Holstein x Friesian crosses in CIS eval with full fraction known



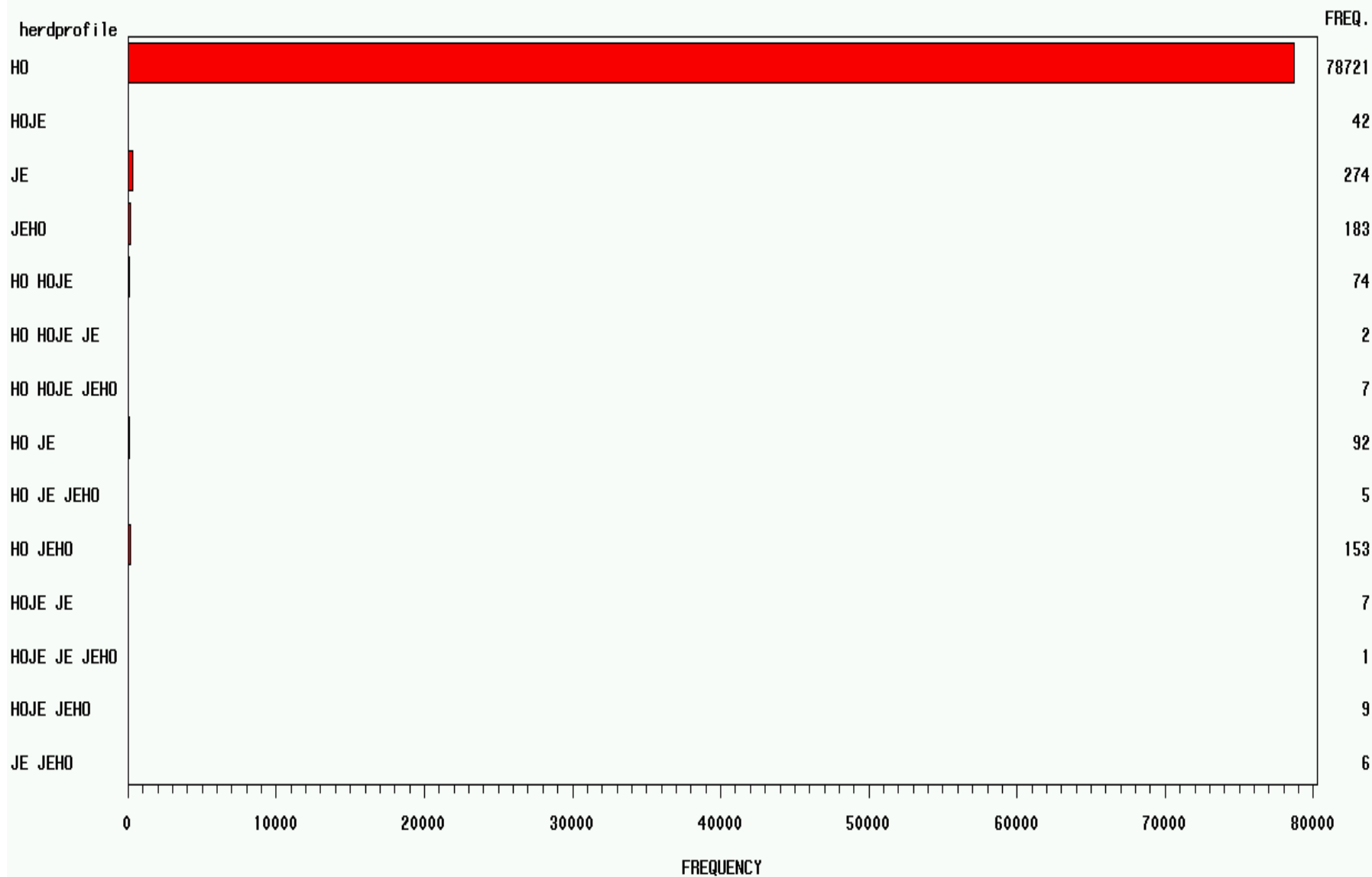
Herd distribution with Holstein, Friesian and combinations in CIS eval



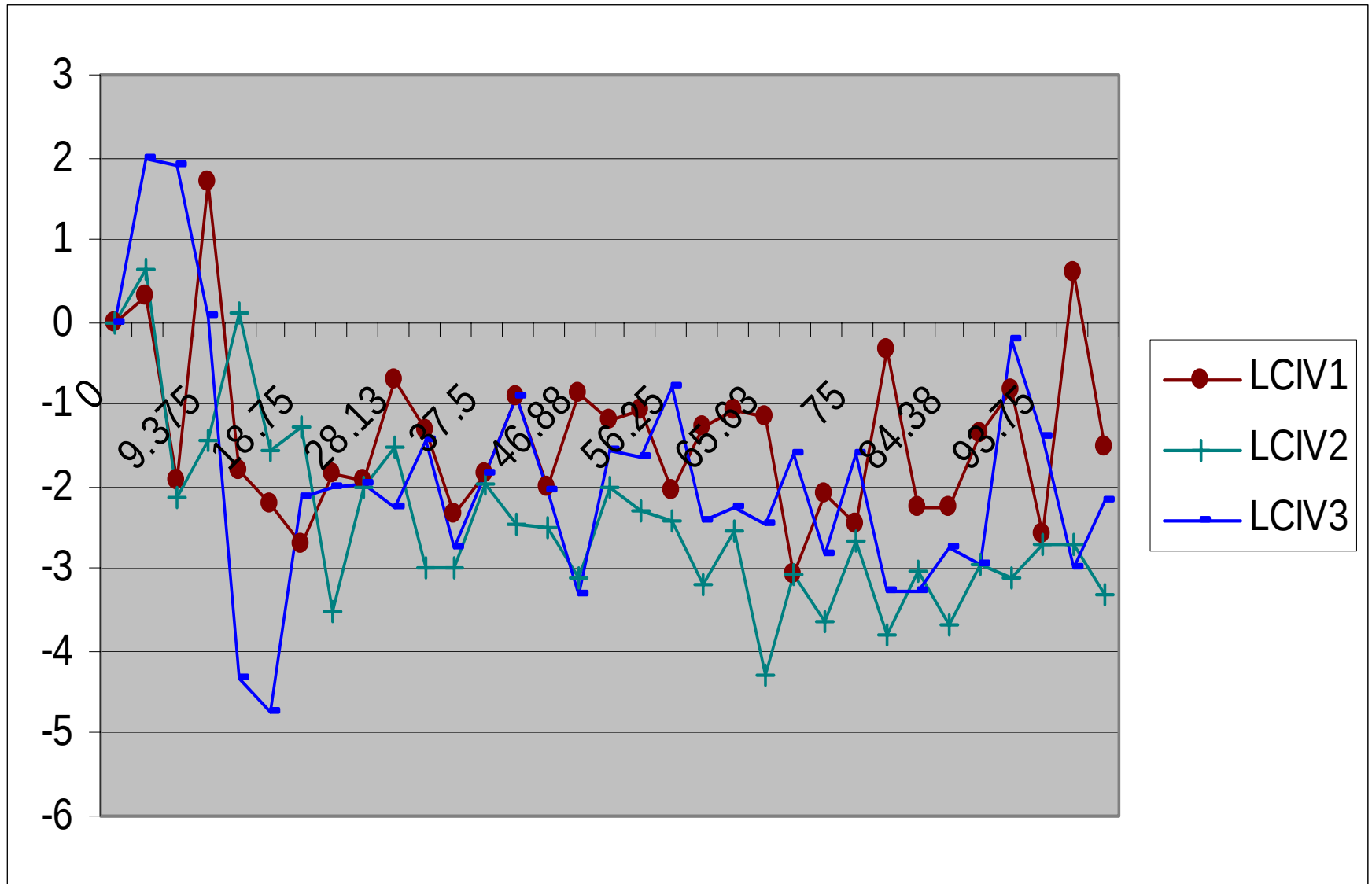
Holstein x Jersey crosses in CIS eval



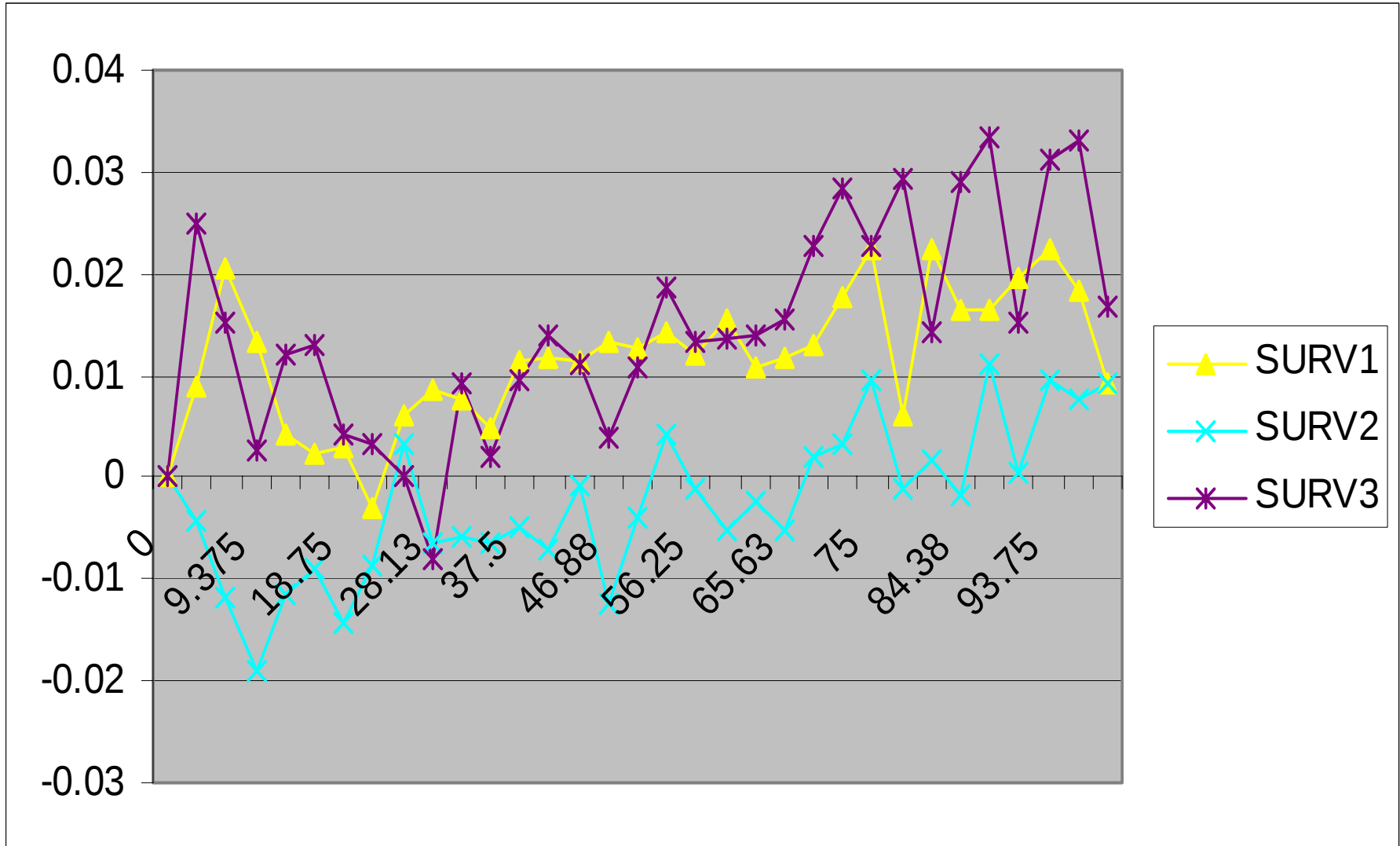
Herd distribution with Holstein, Jersey and combinations in CIS eval



Effect of heterosis on Calving Interval from current models



Effect of heterosis on survival from current models



Next stage...

- **Different evaluations have different breed representations e.g. calving, fertility, production, linear**
- **Establish full spectrum of breeds, crosses and herd linkage in each evaluation for each trait and implement cut-off**
- **Implement across all evaluations**
 - **Milk, fertility, calving beef, health**
- **Report back with test run results**

Plan for next year.

- All changes to implemented by Interbull test run (September 2008)
 - Breeds & breed combinations (milk, CIS & calving traits).
 - CIS updates (e.g., insemination data and age at first calving).
 - Others?
- Development work will start earlier next year (and in future years).
- Next meeting (proposed work areas for 2008) – Feb 2008.