



IRISH CATTLE BREEDING FEDERATION

ICBF Beef & Dairy Industry Meeting. 22 May 2015.



Agenda.

- Euro-Star indexes; Update on economic values (terminal, replacement and dairy beef) – Paul Crosson.
 - Prediction of cow intake – Ross.
- Construction/presentation of Euro-Star indexes – Ross Evans.
- Implementation/roll-out plan re: new indexes – Pearse Kelly.
- GEN€ IRELAND Beef breeding program – Andrew Cromie
- Developments in genetic evaluations; calving traits, maternal milk (based on milk score data), cow maintenance/live-weight – Ross Evans.
- Lunch break
- Genomics Research; Update – Francis Kearney.
- Suckler Beef Genomics Scheme; Update – Andrew Cromie.
- Dairy Test-day model evaluations; Update – Ross Evans.

Prediction of Cow maintenance intake

Research evidence that bigger cows eat more

of low milk production. Differences in milk production explained 23% of the variation in maintenance requirements suggesting that important differences exist beyond those associated with milk production potential. The higher intake of grass silage by C and SLF cows in the present study can be attributed to their live weight and/or milk production potential (Petit *et al.*, 1992). In accord with the present find-

cows (Petit *et al.*, 1992). The higher intake of grass silage for SLF than LLF is consistent with other studies at this centre involving Simmental × Holstein-Friesian and Limousin × Holstein-Friesian cows (McGee and Drennan, 2008). This reflects the higher energy requirements and associated higher intake capacity of the Simmental than Limousin breed (Drennan, McGee and Grogan, 2005).

Petit, M., Jarrige, R., Russel, A.J.F. and Wright, I.A. 1992. Feeding and nutrition of the suckler cow. In: "Beef Cattle Production, World Animal Science", (ed. R. Jarrige and C. Beranger), C5, Elsevier, Amsterdam, pages 191–208.

Performance and feed intake of five beef suckler cow genotypes and pre-weaning growth of their progeny

Irish Journal of Agricultural and Food Research 47: 13–25, 2008

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Available industry data

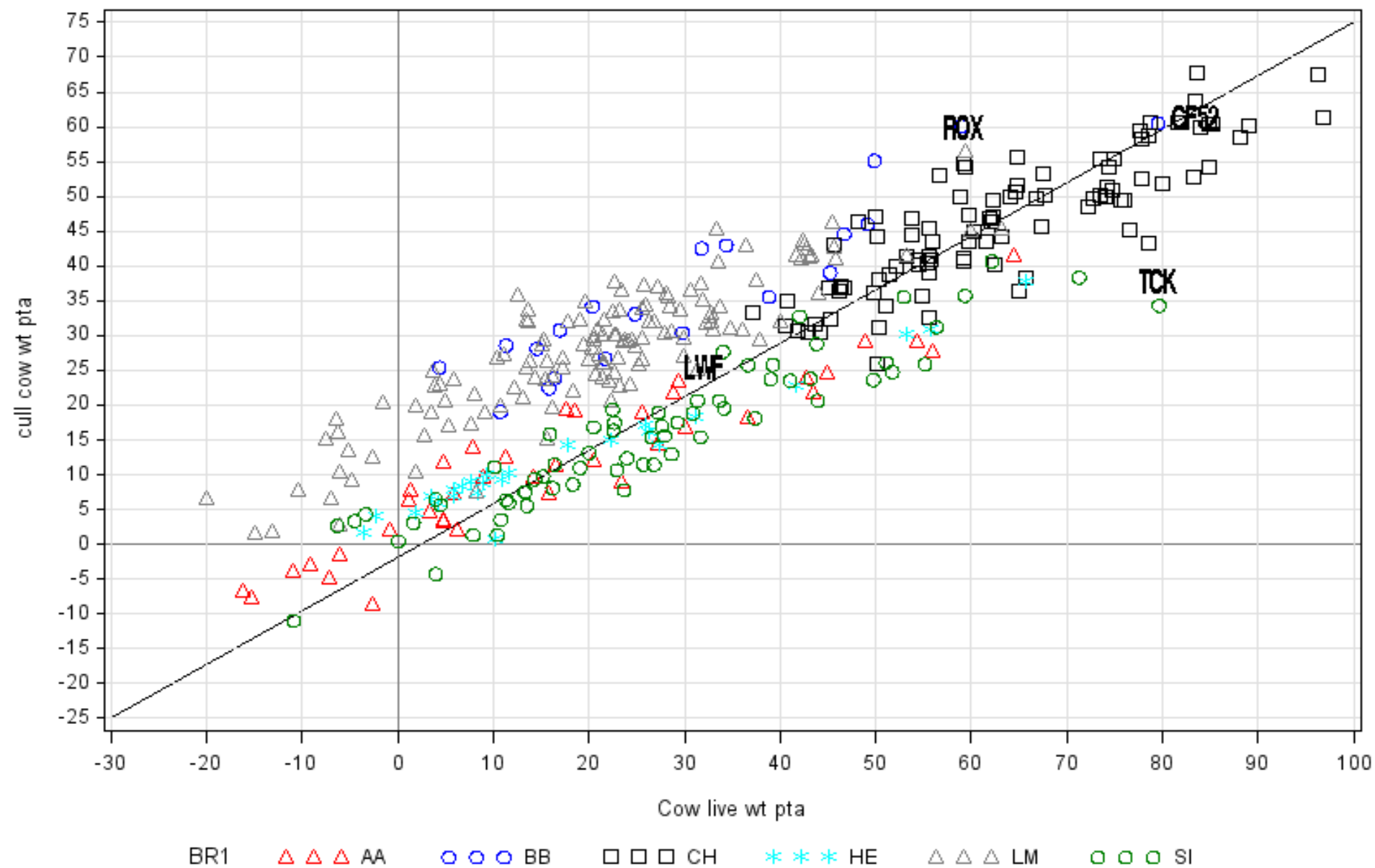
primary breed	feed intake in Tully (kg/DM) records	feed intake in Tully (kg/DM) average	cow live weight records	cow live weight (kg)	cull cow carcass weight records	cull cow carcass weight (kg)
Angus	302	11.7	19,154	615	139,149	320
Aubrac	46	9.7	975	634	4,705	348
Blonde Aquita	114	10.3	1,313	668	10,710	383
Belgian Blue	197	11.7	10,243	634	65,963	345
Charolais	1,029	11.1	36,291	691	247,244	386
Friesian			22,711	569	207,621	292
Hereford	169	11.1	8,802	617	80,602	325
Holstein			251,633	571	1,253,462	299
Jersey			16,397	444	14,332	224
Limousine	1,620	10.4	47,178	635	307,073	357
Montbeliarde			13,578	575	28,325	308
Normande			3,805	578	1,046	317
Norwegian Red			11,848	530	3,095	289
Piemontese	14	10.3	280	563	1,159	342
Partenaise	43	11.6	430	652	1,666	389
Romagnola	1	11.1	36	637	190	326
Saler	108	10.8	2301	628	12,894	353
Shorthorn	24	12.0	6399	578	30,344	299
Simmental	1,010	11.3	16321	645	114,749	339
Total	4,677		469,695		2,524,329	

Penalising higher intake in current Replacement index

Breed	cull cow pta	€ in index	feed intake from tully pta	€ in index
SH	5	-€16	0.18	-€12
AA	20	-€64	0.14	-€9
HE	22	-€70	0.15	-€10
SA	25	-€80	-0.4	€27
AU	27	-€86	-0.52	€35
SI	30	-€96	0.33	-€22
LM	39	-€125	-0.49	€33
BB	43	-€138	-0.78	€52
PT	46	-€147	-0.66	€44
BA	55	-€176	-0.45	€30
CH	55	-€176	-0.08	€5

Comparing cull cow wt and cow livewt

No of bulls 377 correlation $r = 0.869$



ROX Tully progeny performance

Feed Intake (Kg dry matter intake/days at tully)

Ranking information

Date of Evaluation	Percentile Rank within breed	Star rating within Breed	PTA	Reliability	Percentile Rank across Breed	Star rating across all Breeds
Apr 2015	21	★ ★ ★ ★ ★	-0.42	84	70	★ ★ ★ ★ ★

Sire Progeny and Progeny Herdmate Information

Date of Evaluation	No. of Progeny	No. of Herd Mates	Avg Progeny	Avg Herd Mates
Apr 2015	22	484	11.4	12

TCK Tully progeny performance

Feed Intake (Kg dry matter intake/days at tully)

Ranking information

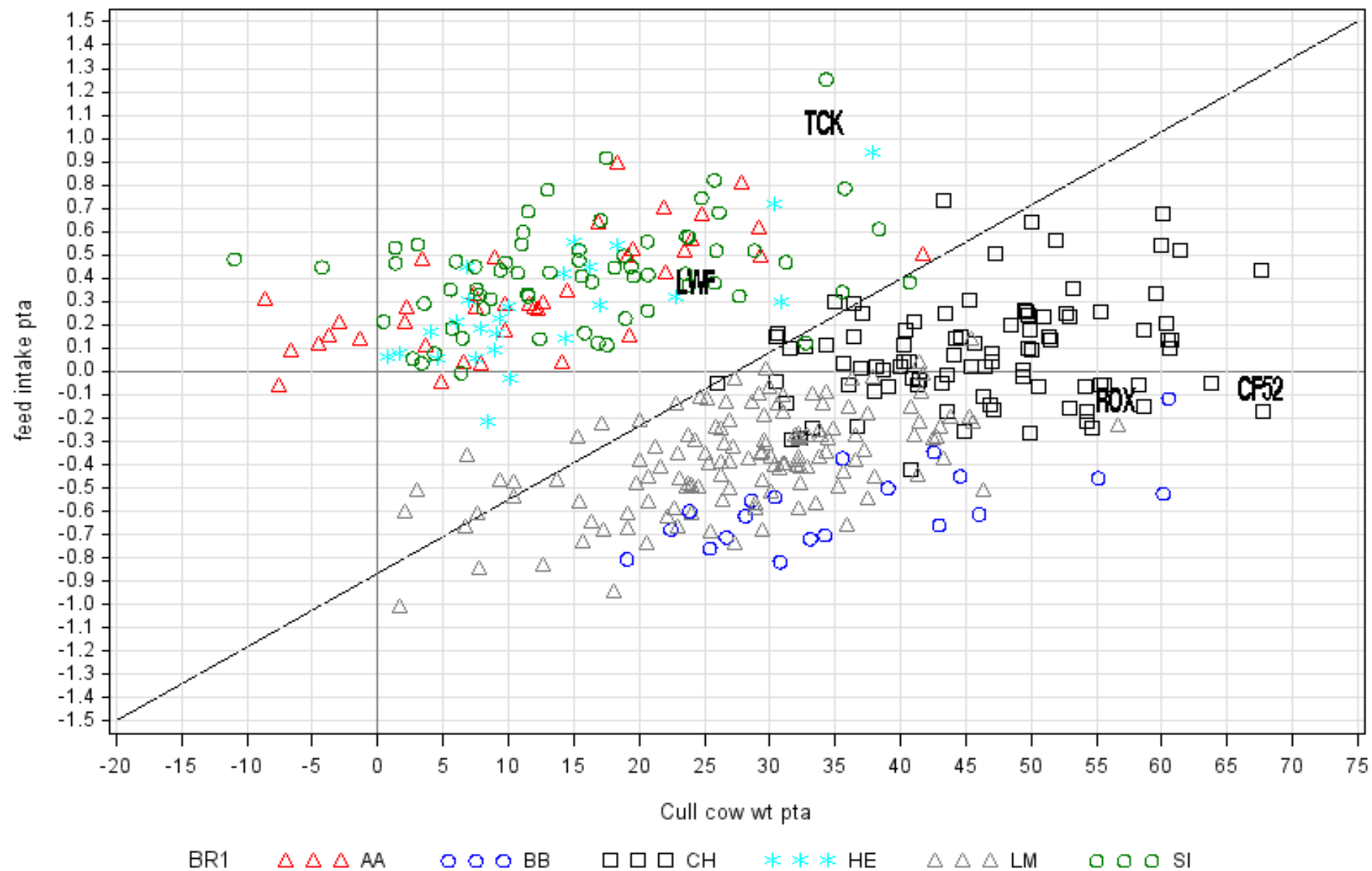
Date of Evaluation	Percentile Rank within breed	Star rating within Breed	PTA	Reliability	Percentile Rank across Breed	Star rating across all Breeds
Apr 2015	1	★☆☆☆☆	0.74	69	1	★☆☆☆☆

Sire Progeny and Progeny Herdmate Information

Date of Evaluation	No. of Progeny	No. of Herd Mates	Avg Progeny	Avg Herd Mates
Apr 2015	5	288	12.5	10

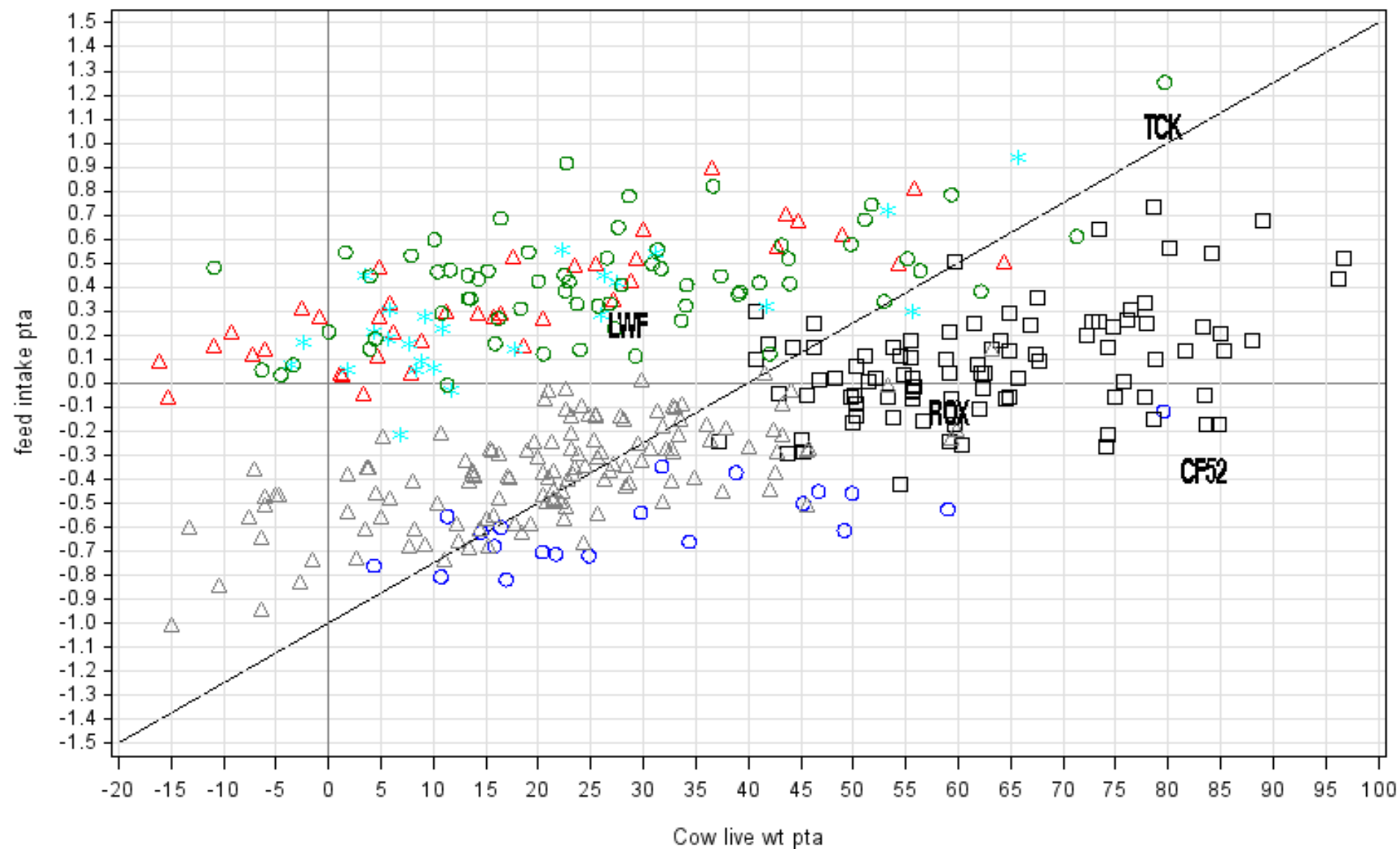
Comparing progeny feed intake and cull cow weight

No of bulls 377 correlation $r = -0.101$



Comparing progeny feed intake and cow live weight

No of bulls 377 correlation $r = 0.31$



Impact of switch to liveweight pta

Breed	Cull cow weight		conformation	Cow liveweight		Impact
	pta	€ in index		cow lwt	€ in index	
SH	5	-€16	0.5	-3	€5	€21
AA	20	-€64	0.8	25	-€40	€24
HE	22	-€70	0.6	27	-€43	€28
SA	25	-€80	1.1	17	-€27	€53
AU	27	-€86	1.9	19	-€30	€56
SI	30	-€96	1.3	41	-€65	€31
LM	39	-€125	2.1	31	-€49	€76
BB	43	-€138	2.8	38	-€60	€77
PT	46	-€147	2.2	29	-€46	€101
BA	55	-€176	2.1	51	-€81	€95
CH	55	-€176	2	69	-€109	€67

Summary

- Cow livewt a better predictor of maintenance requirements than cull cow weight
- Apply new economic values based on cow live-weight.



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Economic Value Changes.

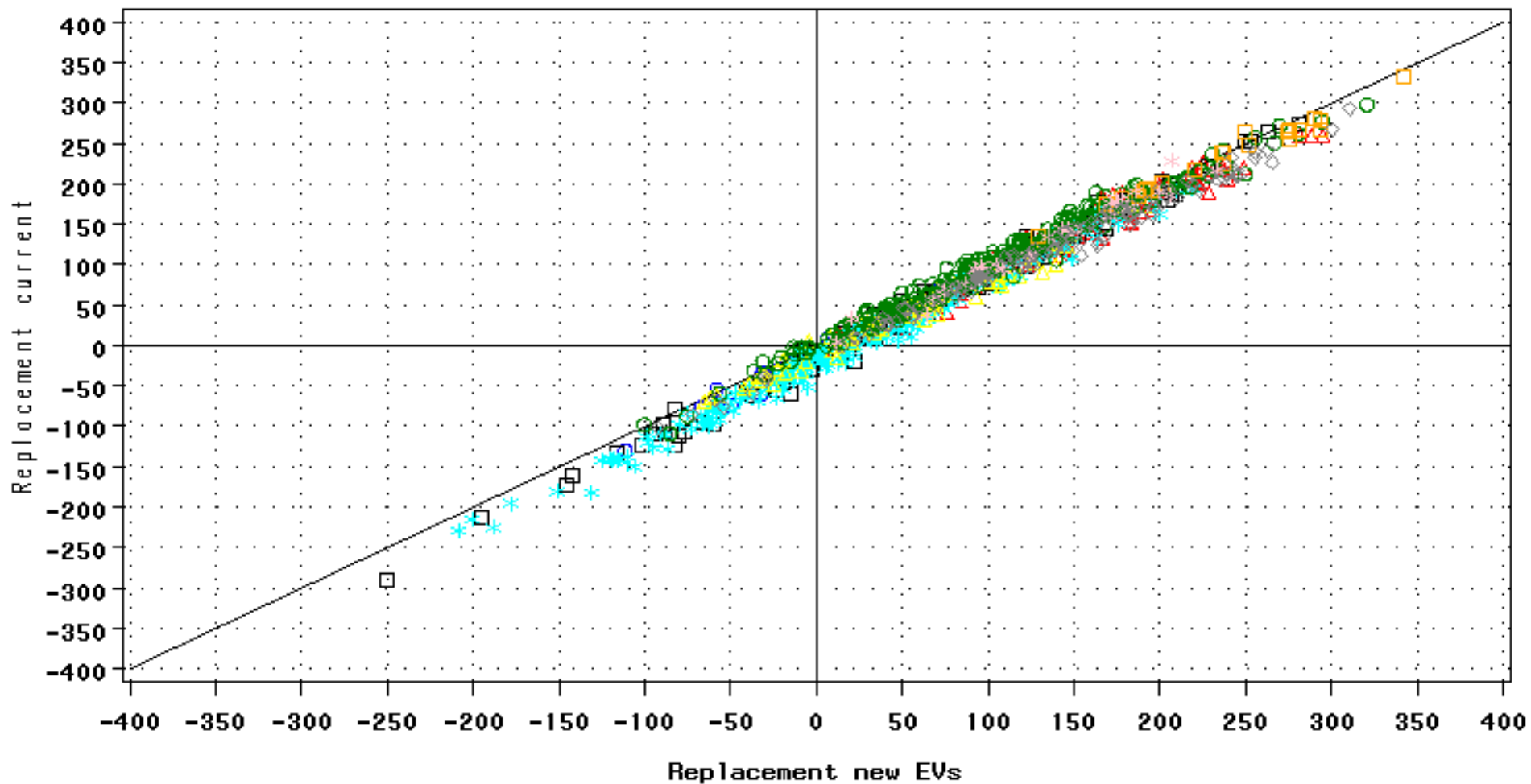


AI sires 70% rel: Repl current v Repl new EVs

No of bulls 960 correlation $r = 0.991$

Repl current mean = 77 {stdev = 93}

Repl New EV/s mean = 89 {stdev = 90.3}



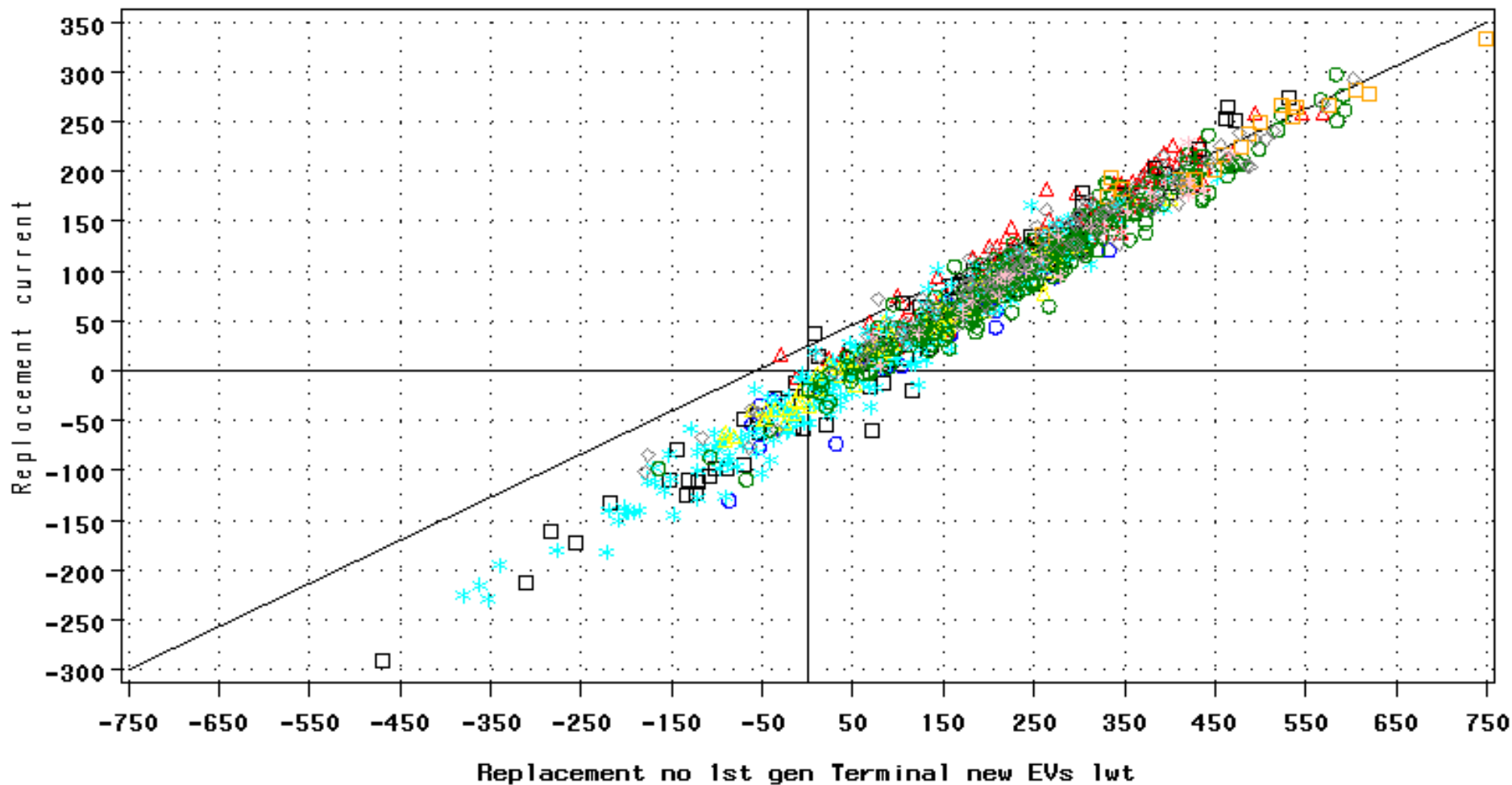
Breed	Symbol	Breed	Symbol	Breed	Symbol	Breed	Symbol	Breed	Symbol
AA	△	BA	○	BB	□	CH	*	HE	△
LM	○	SA	□	SH	*	SI	◇		

AI sires 70% rel: Repl v Repl no 1st gen TERMINAL new EVs + lwt

No of bulls 960 correlation $r = 0.98$

Repl current mean = 77 {stdev = 93}

Repl No Term new EV's lwt mean = 190 {stdev = 169.8}



Breed	AA	BA	BB	CH	HE	LM	SA	SH	SI
Symbol	△ △ △	○ ○ ○	□ □ □	* * *	△ △ △	○ ○ ○	□ □ □	* * *	◇ ◇ ◇

Summary & Recommendation.

- Little change in economic values => confidence that initial work undertaken in 2012 is robust.
 - Cow live-weight is a better predictor than cull cow weight. Use this trait going forward.
- **Recommendation: That ICBF update the new economic values into the Euro-Star indexes. These changes to become effective as soon as possible, or certainly by the next routine genetic evaluation run (August 2015).**



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Index Construction.



Relative emphasis in the Replacement Index

Relative emphasis

Calculated from two key pieces of info on each traits

1. Genetic variation in that trait
2. Economic value for that trait

Only relevant at an overall breeding program level

The relative emphasis of each trait to the overall index is different for every bull because their genetic merit is different

	Emphasis based on all sires >60% rel
trait	
calving difficulty	11%
gestation	2%
mortality	2%
docility	4%
carcass weight	14%
carcass conformation	4%
carcass fat	2%
feed intake	8%
Age 1st Calving	5%
Maternal cdiff	5%
milk	13%
Calving interval	6%
daughter survival	6%
heifer intake	7%
cow intake	7%
cull cow weight	5%

Star Rating (within Limousin breed)	Economic Indexes	€uro value per progeny	Index reliability	Star Rating (across all beef breeds)
★★★★★	Replacement Maternal Cow Traits Maternal Progeny Traits	€255 €-20 €275	61% (High) 51% 71%	★★★★★
★★★★★	Terminal	€170	69% (High)	★★★★★
☆☆☆☆☆	Dairy Beef	€	% (N/A)	☆☆☆☆☆

Star Rating (within Limousin breed)	Key profit traits	Index value	Trait reliability	Star Rating (across all beef breeds)
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Expected progeny performance

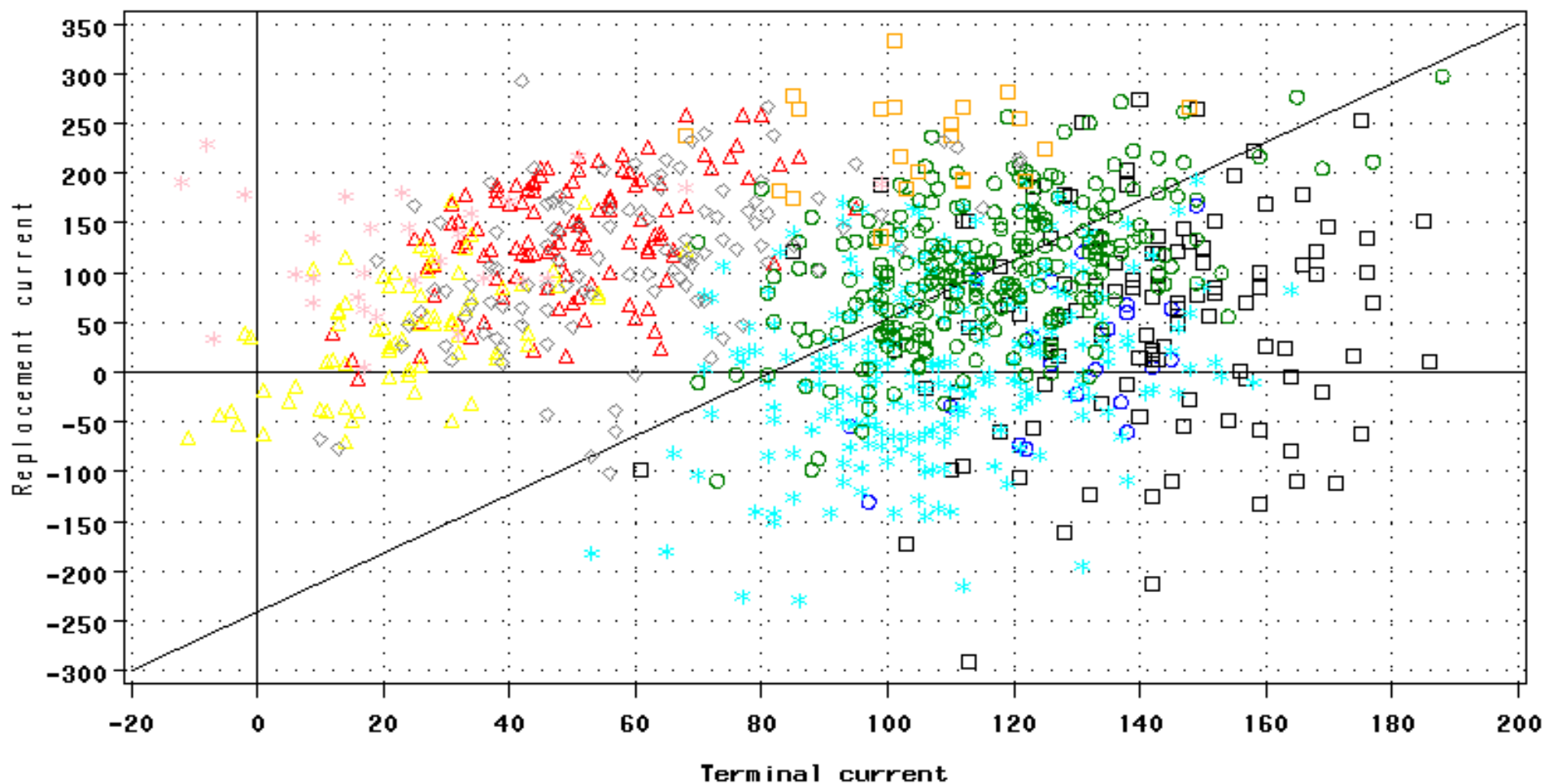
	Calving difficulty (% 3 & 4) Breed ave: 4.95%, All breeds ave: 4.99%	4.50%	87% (V High)	
★★★☆☆	Docility (1-5 scale) Breed ave: -0.06, All breeds ave: 0.00	-0.07 scale	85% (V High)	★★★☆☆
★★★★★	Carcass weight (kg) Breed ave: 23.88kg, All breeds ave: 22.88kg	37kg	74% (High)	★★★★★
★★★★★	Carcass conformation (1-15 scale) Breed ave: 2.11, All breeds ave: 1.84	2.53 scale	68% (High)	★★★★★

AI sires 70% rel: Repl current v Terminal current

No of bulls 960 correlation $r = -0.023$

Repl current mean = 77 {stdev = 93}

Term current mean = 93 {stdev = 418}



Breed	△ △ △ AA	○ ○ ○ BA	□ □ □ BB	* * * CH	△ △ △ HE
	○ ○ ○ LM	□ □ □ SA	* * * SH	◇ ◇ ◇ SI	

The Replacement index: € per calf born to bull

Bull A

50% males

Generation 1: (A)

Progeny for sale/slaughter.

Key traits: Calving, feed

intake & beef merit

50% females

Generation 1: (B)

Replacement females.

Traits: Milk, fertility, survival,

$$\begin{aligned} \text{Index} &= 0.5 * \text{Generation 1 males (Terminal)} \\ &+ 0.5 * (\text{Generation 1 females} + \text{their offspring}) \\ \text{CF52} &= 0.5 * (158) + 0.5 * (-498 + 320) = -€10 \end{aligned}$$

Male Progeny for
slaughter. Traits:
Calving, feed intake &
beef merit.

€ per lifetime of
daughter

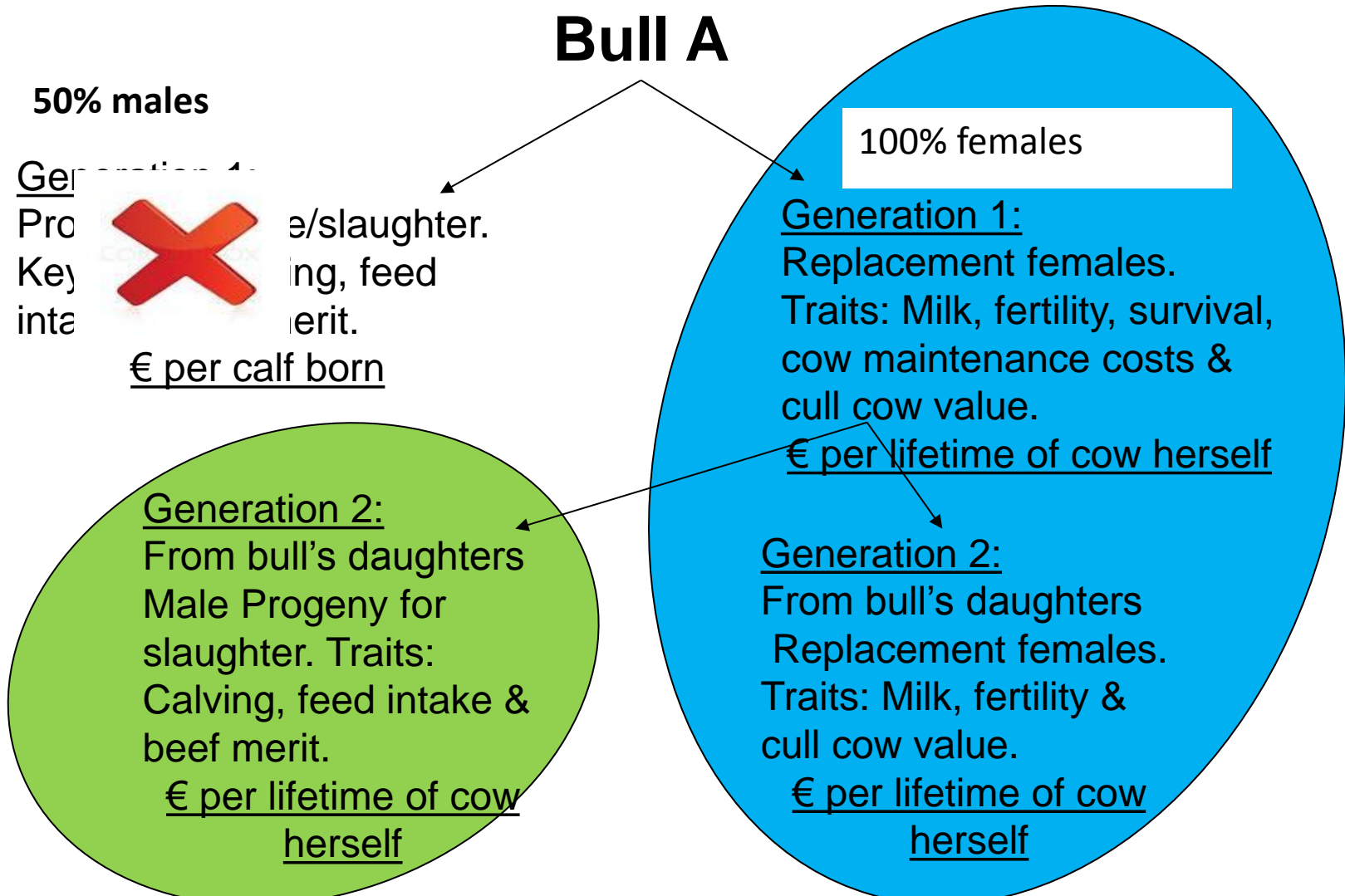
From bull's daughters
Replacement females.
Traits: Milk, fertility &
cull cow value.

€ per lifetime of
daughter

Maternal Progeny traits

Maternal Cow traits

Replacement index: € profit per cow



Maternal Progeny traits

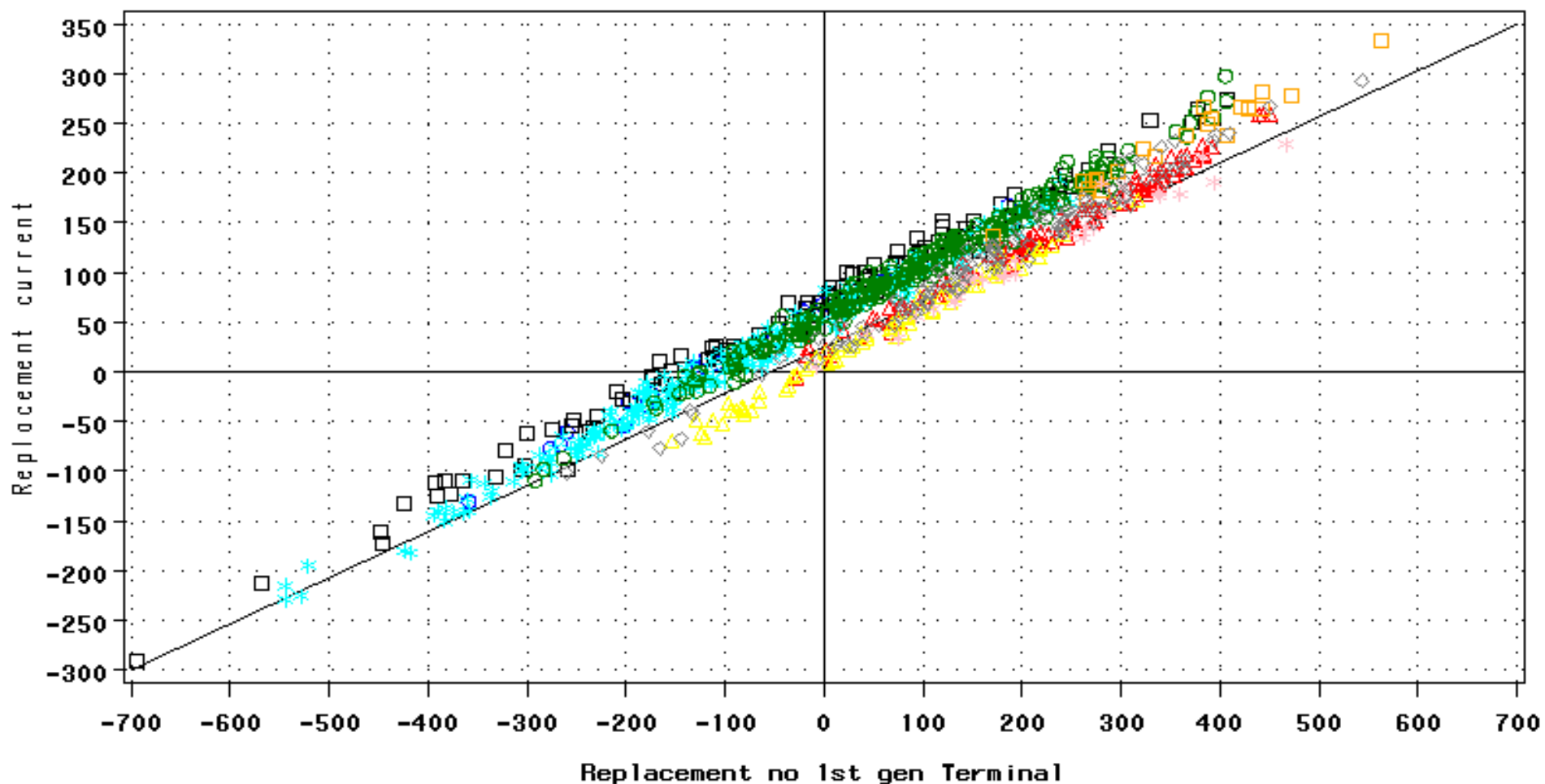
Maternal Cow traits

AI sires 70% rel: Repl v Repl no 1st gen TERMINAL

No of bulls 960 correlation $r = 0.976$

Repl current mean = 77 {stdev = 93}

Repl No Term mean = 62 {stdev = 191.5}



Breed	AA	BA	BB	CH	HE	LM	SA	SH	SI
Symbol	△ △ △	○ ○ ○	□ □ □	* * *	△ △ △	○ ○ ○	□ □ □	* * *	◇ ◇ ◇

Options Considered.

Option	Description
1. Current; Replacement & Terminal.	Separate Replacement and Terminal Index. Replacement Index defined on basis of all male & female progeny (1 st generation) and all male & female progeny (2 nd generation). Replacement Index is presented with a cow and a calf contribution, with these adding to equal the replacement index.
2. Replacement 2 & Terminal.	Separate Replacement and Terminal Index. Replacement Index defined on basis of female progeny only (from 1 st generation) and all male & female progeny (from 2 nd generation). No cow and calf contribution presented with the index.
3. Replacement 2 & Terminal	Separate Replacement and Terminal Index. Two versions of Replacement Index. Replacement Index (option 1) for bulls and Replacement2 Index (option 2) for females.
4. Overall Index, cow and calf contribution.	Single overall index, based on current Replacement Index. Cow and calf contribution sub-indexes retained and presented as sub-indexes, with the cow sub-index largely reflecting maternal traits and the calf sub-index largely reflecting terminal traits. Terminal Index displaced with as a main index, and instead calf contribution sub-index would become new index for terminal traits.
5. Overall Index; Replacement 2 & Terminal.	Single overall index, based on current Replacement Index. Sub-indexes based on Replacement2 index (from above) and Terminal.

Pros & Cons.

Option	Positives	Negatives.
Option 2; Replacement 2 & Terminal	<ul style="list-style-type: none"> • Little change from an industry standpoint. • More accurate index for females. • Better aligned to new BGDG. • One figure for mart display boards. 	<ul style="list-style-type: none"> • Risk that wont get required change in breeding policy (towards replacement index) from bull breeders. • Continuation of two indexes (replacement and terminal), not one, resulting in less “balanced” animals.
Option 4/5; Overall index, with sub-indexes	<ul style="list-style-type: none"> • Better index to drive long term genetic gain. • More balanced index for industry. • Principle (overall index & sub-indexes) has worked well in context of EBI. 	<ul style="list-style-type: none"> • Not as relevant an index for females. • Risk of lacy of “buy-in”

Compare Current v New Top 50 All AI sires

index option	Current Repl index	New Repl index	Cow Traits	Progeny Traits	Terminal		
Current Replacement index	€265	€170	€106	€64	€113		
New Replacement index	€257	€177	€123	€53	€95		
index option	afc	mcdiff	milk	civ	survival	cow lwt	cull cow wt
Current Replacement index	-16	6.4	10.5	-3.6	2.4	25	28
New Replacement index	-13	6.3	13.2	-3.8	2.4	22	25
index option	cdiff	gest	cwt	conf	feed intake		
Current Replacement index	3	0.9	20	1.5	-0.22		
New Replacement index	3.2	1.1	18	1.2	-0.06		

Top bulls in each breed.

breed	aicode	ANIMAL NAME	Replacement current (per calf born to bull the)	Replacement new (per lactation of daughter)	cow contrib (new)	progeny contrib (new)	Repl new rel	cow contrib rel	TERMINAL new EVs
AA	RAW	RAWBURN TRANSFORMER	€259	€193	€148	€44	80	76	€101
AU	NED	NEMROD	€169	€89	€20	€68	72	70	€109
BA	HIV	HIVER	€168	€89	€9	€80	76	71	€145
BB	SFI	SPRINGFIELD PATRICE	€274	€152	€78	€74	83	80	€137
CH	PNY	PINAY	€194	€116	€25	€91	80	72	€154
HE	GGD	GLASLOUGH NED	€174	€143	€130	€13	70	64	€48
LM	ONI	ON-DIT	€262	€174	€97	€77	88	83	€148
PT	BZB	BOLIDE	€187	€147	€91	€56	76	60	€116
SA	JVL	JOVIAL	€333	€254	€198	€56	90	91	€97
SH	BBP	BILBRO STEPHEN	€191	€172	€173	€0	78	74	-€17
SI	HUZ	HARUM	€267	€196	€145	€52	73	65	€90

5 Star Bulls in All Breeds (Across Breed Basis).

Breed	1 Star	2 Star	3 Star	4 Star	5 Star	Overall
AA		8	19	41	65	133
AU		4	3	5	5	17
BA	16	9	4	7	1	37
BB	65	45	32	15	6	163
CH	110	71	35	19	5	240
HE	6	28	24	19	9	86
LM	20	50	82	63	47	262
PT	1	6	6	8	4	25
SA			1	4	31	36
SH			6	13	20	39
SI	6	9	18	36	36	105
Overall	224	230	230	230	230	1144

Latest Results - Grange Maternal*

	High Replacement Index	Low Replacement Index
Age at 1 st calving (days)	752	769
Gestation Length (days)	283	290
Calving (date)	16 March	29 March
Cow weight at calving (kg)	511	522
Weaning weight (kg)	261	255

- * *Based on female indexes taken from Autumn 2012.*
- 4 & 5 star animals are delivering; more milk, improved fertility & better calves.

Discussion.

- Good discussion re: pro's and cons of two indexes versus one.
- On balance, view was to retain two, primarily to align with new beef genomics & data program (BGDP).
 - Accurate index for females, mart display boards, consistency of message.

Recommendation.

- **Recommendation:** That ICBF update the current Euro-Star replacement index to reflect the new proposed construction, as defined in option 2 above. This index would then be presented for all breeding animals (AI sires, stock sires and females). In addition it would be the only index presented for females. AI sires and stock sires would continue to have to other indexes presented for them, a terminal index and a dairy beef index (still under construction). These changes to become effective as soon as possible, or certainly by the next routine genetic evaluation run (August 2015).



AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

The Irish Agriculture and Food Development Authority

Implementation of Euro-Star Indexes

- Planned Initiatives -

Objectives

- Build an awareness and an understanding of the indexes among farmers, pedigree breeders, advisers and the wider beef industry
- Suckler farmers to make greater use of the indexes when selecting AI bulls, stock bulls and replacement heifers
- Provide suckler farmers with greater access to the indexes to help them easily identify high index replacement heifers for breeding
- Create a momentum behind the indexes to ensure it becomes one of the main KPI's targeted for improvement in suckler herds

Progress to Date

- Breeding Workshop held in Portlaoise on 10th December 2014 bringing together the relevant Teagasc researchers, specialists and managers along with ICBF
 - Review of the indexes and results to date
 - Work plan for a follow up meeting
- Follow up meeting held in Moorepark on 20th January 2015
 - National and Teagasc Data reviewed
 - Euro-star implementation initiatives proposed
- Teagasc-ICBF Implementation sub-committee met 11th February 2015 to agree initiatives for progressing, target deadlines and persons responsible

Proposed Initiatives

- | | | |
|---|--|--|
| (1) Teagasc Suckler Weighing Farms | <ul style="list-style-type: none">- 48 farms that are in discussion groups (4 / region)- Herds with high % of sires recorded on cows- Weigh weanlings twice /year (for 3 years)- Farms will be a focus for other groups to visit- Demonstrate High & Low index cows & their calves | Aidan Murray & Chris Daly |
| (2) Correlate breeding data with other farm data | <ul style="list-style-type: none">- Examine 500 – 1,000 herds- Herds with a high % of cows with indexes and data for eProfit Monitor, carbon footprint and other breeding data- Compare data for trends and relationships | Noirin McHugh |
| (3) Replacement Index Farmer Competition | <ul style="list-style-type: none">- Competition to focus on high index herds with high profitability and good breeding data- 2015 competition to focus on 48 Teagasc weighing Farms- Top farm from each regional unit selected and visited- Need a sponsor | James Keane & Pat Donnellan |
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Proposed Initiatives

- | | | | |
|------------|--|--|---|
| (4) | Proposed High Index Demo Suckler Herd in Pallaskenry Ag College | <ul style="list-style-type: none">- 50 cow herd that will be changing rapidly over coming two years- Opportunity to bring in very high genetic merit replacements- €200+ Replacement Index Herd- Act as a demo farm in the South-west | Andrew Cromie & Pearse Kelly |
|------------|--|--|---|
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- | | | | |
|------------|-----------------------------|---|---------------|
| (5) | Mart Display Screens | <ul style="list-style-type: none">- Greater need to identify High Index Heifers- Proposed New Beef Genomics scheme has a requirement to breed from high index replacements- 70 marts with 1-2 sales rings /mart- ICOS positive towards the initiative- Funding? | Andrew Cromie |
|------------|-----------------------------|---|---------------|
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- | | | | |
|------------|-------------------------------------|---|-------------------------------|
| (6) | Adviser Study Trip to France | <ul style="list-style-type: none">- Adviser/Specialist/Researcher study trip to see maternal breeding programmes in action- Visit breed centres and farms- 2nd Week September 2015- 24 advisers, specialists & ICBF personnel | Pearse Kelly & Thierry Pabiou |
|------------|-------------------------------------|---|-------------------------------|
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Summary & Recommendation

- **Summary.** Initiatives are progressing well. Some requirement for additional resources (marts, weight recording). Discussions underway.
- **Recommendation.** That ICBF supports the various initiatives and where appropriate provides the necessary resources to ensure execution of the initiative.



IRISH CATTLE BREEDING FEDERATION

GENE IRELAND Review.



Objective.

- To undertake a comprehensive review of GEN€ IRELAND Maternal Beef Breeding Program.
 - Financial – cost & how to fund?
 - Technical – how many bulls/breed, number herds, level genotyping....?
 - Operational – growing participation (bull breeders herds, progeny test), linking in with AI companies (bulls/herds)....?

Outcome.

- Work is still on-going.
- Will continue over summer and be reported in Autumn 2015, in line with a review of operation of GENÉ IRELAND (Beef & Dairy).

Recommendation.

- Recommendation: That ICBF only purchases bulls for the GEN€€ IR€LAND Bull Breeding Program that are a minimum of 4 stars (top 40%) on a within breed basis for replacement index. The same principle should apply for bulls being forward into the GEN€€ IR€LAND program by participating AI companies.