

IRISH CATTLE BREEDING FEDERATION

ICBF Dairy Genetic Evaluation Meeting

Cork Airport Hotel
21st January 2009

Overview

- Genomic Selection
 - Results of research work
 - Implications of Work
- Developments in ICBF dairy evaluations – Update.
 - Calving performance evaluations (conversion of foreign proofs).
 - Interbull test runs for calving performance, fertility & other dairy breeds.
 - Genetic evaluations for farmer management traits.
 - Use of insemination data in fertility evaluations.
 - Use of mart data in beef evaluations.
 - Across breed evaluations (including culling indexes).
 - Linear type (base & definition of composites).
 - Updating EBI (economic weights)
- Genetic evaluation schedule 2009
- AI Bull application process.
- Proposed “Profit from Breeding – Best Practice” campaign.

Results

- Donagh Berry



Genomics – Implications (i)

- AI Codes.
 - Provide AI codes & EBI for bulls for which we have genotypes (using Irish genomic key).
 - Local bulls, LIC, ABS Genus....
 - Cut-off – 22nd January.
 - Need genotypes – no conversions.

Genomics – Implications (ii)

- ICBF Active Bull List (February 2009)
 - Teams of Bulls on list (~90%)
 - Minimum 5 bulls * 5 straws (25 straws)
 - AI companies to “nominate” their team to ICBF (minimum 5 bulls.....max?).
 - Promote use of bull teams.
 - Cattle breeding page, AI, Teagasc, IFJ...
 - Monitor usage of bulls via database.
 - No “individual” genomic bulls on ICBF Active bull list (Feb). In future?

ICBF Active Bull List – Spring 2009?

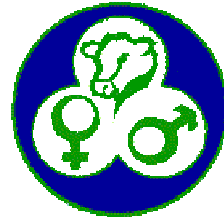
SIRE DETAILS				EBI DETAILS								
RK	Code	Name	% HO	EBI	Rel	Dau	Hrds	MILK	FERT	CALV	BEEF	HLTH
1	OJI	O-BEE MANFRED JUSTICE	100	€245	89	170	62	€119	€77	€47	-€3	€5
2	R XO	RAMOS	100	€213	74	-	-	€49	€122	€35	-€8	€15
3	G IO	GIBOR	97	€195	67	-	-	€73	€84	€31	-€6	€14
4	WUZ	WINDSOR-MANOR DURHAM ZEUS	100	€176	59	-	-	€51	€102	€26	-€7	€5
5	DEU	DONEEN MARLEEN HUGO	59	€160	86	161	124	€88	€73	€14	-€12	-€2
6	LWT	LAINGS WCO NIGHTHAWK	100	€159	58	-	-	€65	€58	€20	€18	-€2
7		G€N€ IRELAND Spring 2009	80	€155	85	-	-	€60	€60	€20	€10	€5
8	NVE	SAND-HILL DELTA NEVADA	100	€155	65	-	-	€51	€93	€19	-€5	-€3
9	WVZ	WHITTAIL-VALLEY ZEST-ET	100	€153	89	133	47	€57	€66	€30	-€7	€8
10	TKY	SRC TIMOTHYS MANDRAKE	100	€153	62	-	-	€71	€68	€32	-€10	-€8
11	RDU	RUUD 96	100	€149	76	71	47	€72	€42	€34	€1	-€1
12	SGV	STIRLING MAGLEY ANVIL	100	€148	63	-	-	€95	€45	€18	-€6	-€4
13	WKP	BAGWORTH KEETS PAL	100	€147	58	-	-	€68	€66	€21	-€8	€0
14	TCZ	ALTA TUCANO	94	€147	71	-	-	€61	€69	€22	-€6	€1
15	RMW	RIVERLOCK MOWING MACHINE	100	€147	64	-	-	€72	€70	€28	-€19	-€5

Terminology?

- Options
 - Proven, forward pack, GENE IRELAND
 - Daughter proven, DNA & Calving proven & Unproven
 - 4 year proven, 1 year proven, Unproven.
 - Old, middle-age, young.
 - Others.....

ICBF Genomic Services.

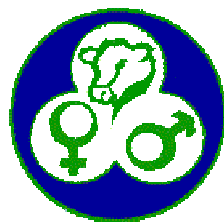
- Farmers/AI companies wanting genomic EBI's this Spring?
- Owner.....DNA....lab.....genotype.....ICBF database.....EBI (including genomic data)owner..... genotype stored in database.....EBI in public domain.....
- *Genotype only available to 3rd party, on consent of owner.*
- Terms & conditions (including cost) – not yet finalised
- Interbull meeting next week.



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Developments in Dairy Evaluations.

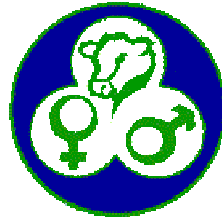
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Use of Insemination Data in Dairy Evaluations

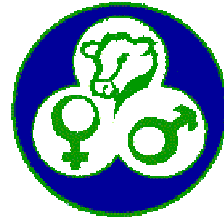
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Use of Mart data in Dairy Evaluations for Beef Traits

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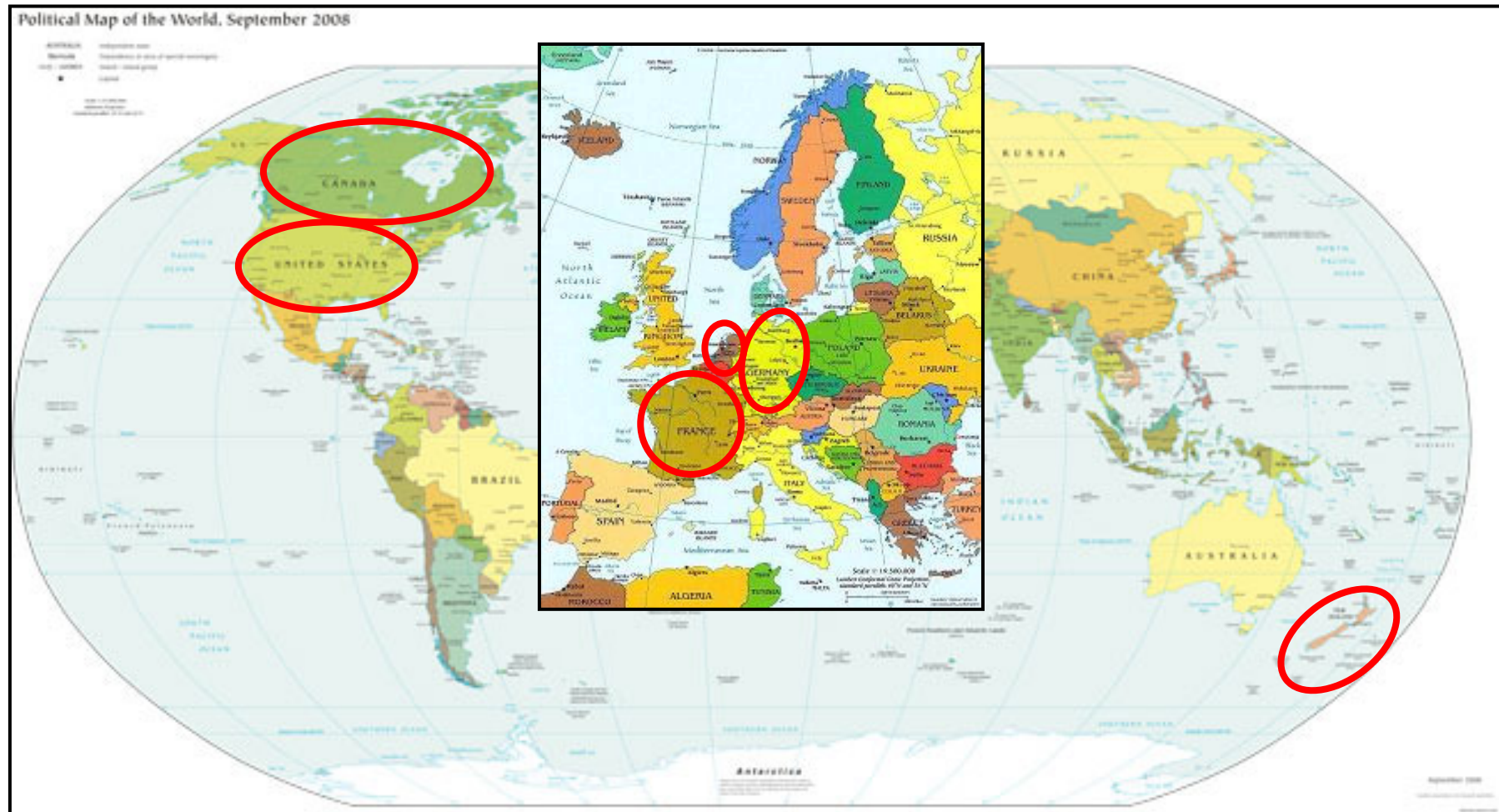
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Conversion Equations for Foreign Animals

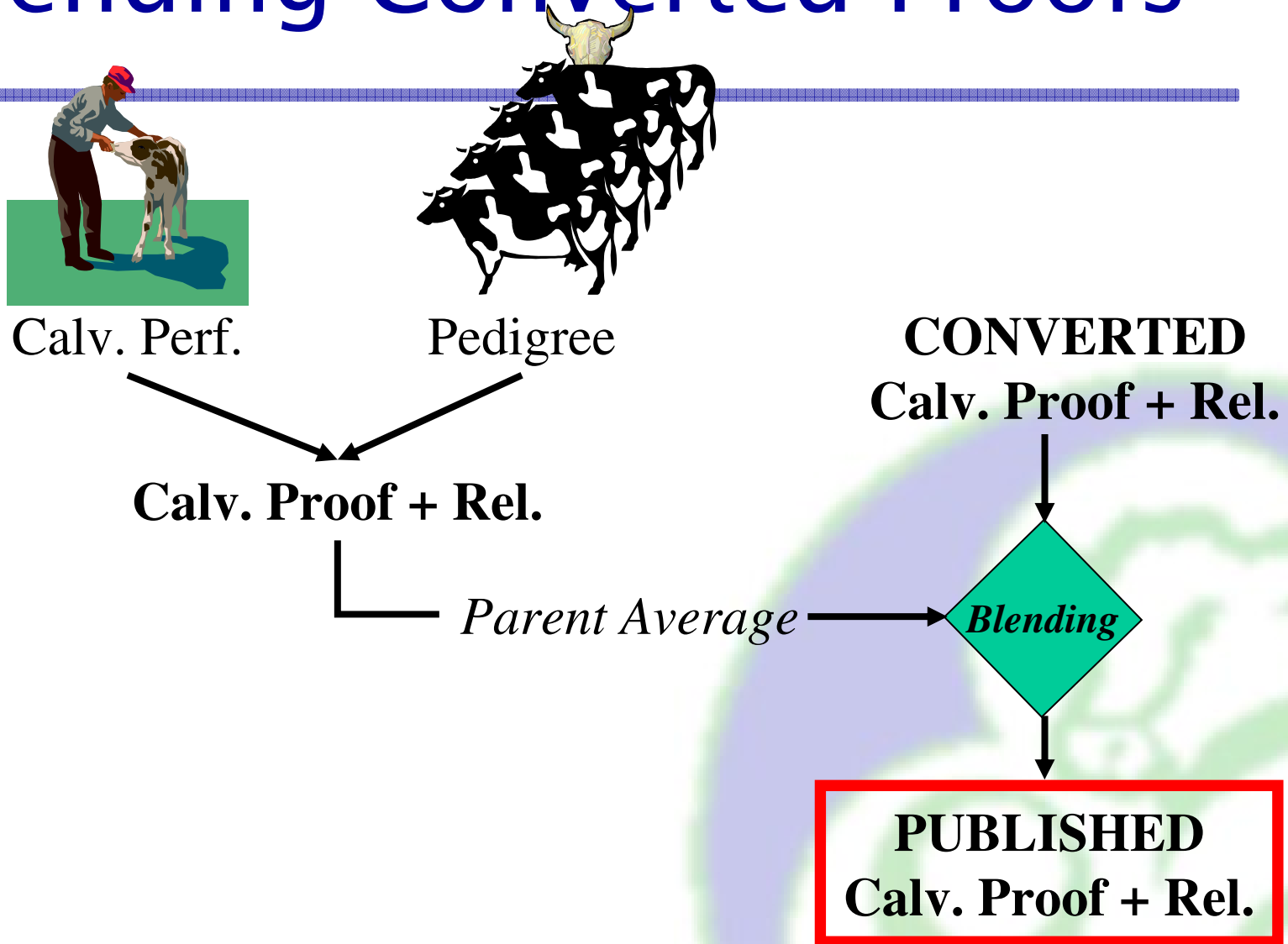
Direct Calving

21 January 2009

Countries Involved



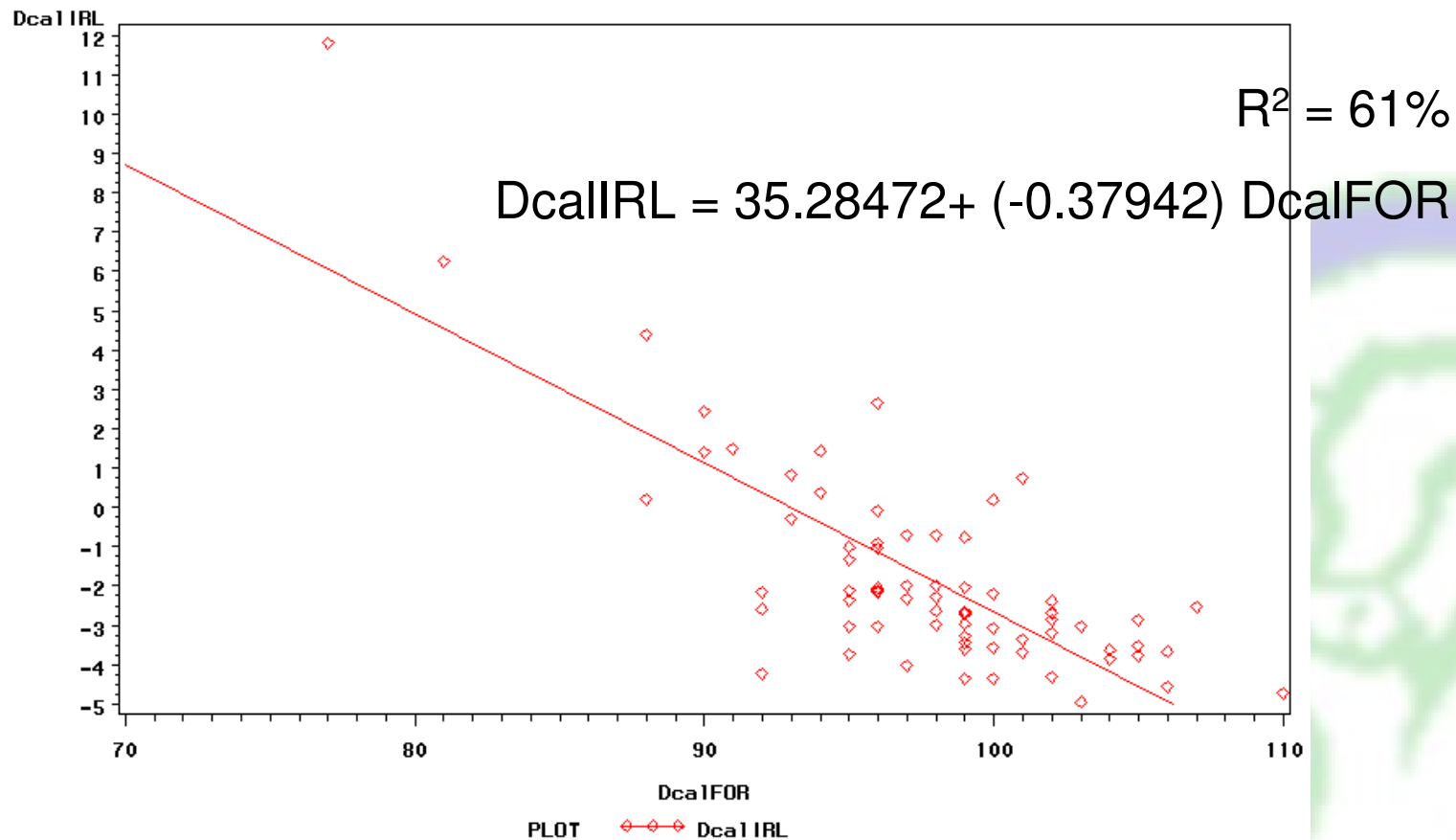
Blending Converted Proofs



Example : Canada

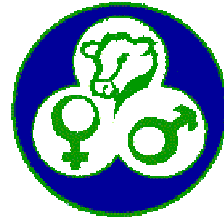
Multiple Correlation for DIRECT CALVING DIFFICULTY Holstein (CAN)

Significant variables $P < 0.15$
Reliability (%) > 0.8



Conversion Parameters

	CAN	DEU	FRA	NLD	NZL	USA
N bulls	73	34	74	91	64	123
Rel_{IRL}	>80%	>80%	>80%	>90%	>80%	>90%
R^2	61%	40%	48%	46%	29%	60%
Est. r_g	82%	67%	76%	74%	66%	81%



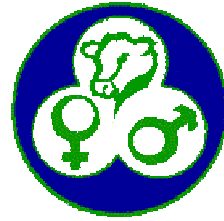
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Interbull Test Runs

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Interbull Test Run

- April 28th and September 8th
- Required to complete test run before entering routine run to make proofs official
- Still borderline with number of bulls for breeds other than HO/FR
- Other Breeds – Jerseys, Red breeds (RDC)
- Other traits
 - Calving for all breeds.
 - New longevity & fertility for all breeds.
 - Longevity, fertility, production for JER/RDC



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Linear Type Evaluations

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Overall Type

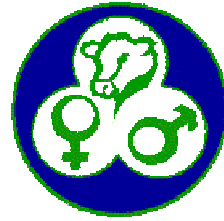
- Change to publication of overall type
- Previously used Overall Type as provided by Interbull
- But definition across country can be different
- Now combine individual traits that make up Overall Type – consistent with UK
- Overall Type = $(0.0562*STA + 0.0106*CW - 0.0612*BD - 0.0314*ANG - 0.0096*RA - 0.0193*RW + 0.393*LAF + 0.792 * MAM)$

Trait Changes.

- Locomotion and Body condition scores are now evaluated by Interbull
- Evaluated domestically for a number of years
- Rear Leg Rear Set was used as predictor of locomotion for foreign bulls
- Locomotion and BCS now available for foreign bulls where country has supplied proofs to Intebull. RLR still used where locomotion is not available

Other Issues.

- Research project – Edinburgh University.
- Definition of Overall Type.
 - Relationship with longevity?
- Multiple breeds.
 - Some data for other breeds, e.g., GENE
IRELAND bulls,
- Irish base & scale.



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Farmer Management Traits

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Background

- Increasing scale; farmers want “easy-care” cows.
- Weight on farmer management traits will increase in future.
- Currently recording a lot of this data across many systems.
- Need to consolidate.

Examples of Records (i)

- Dairy Linear Type
 - Traits: Temperament & Ease of milking.
 - How: 1-9 scale as part of linear score visit.
 - Number: 20k records per year.
- GENRE IRELAND recording
 - Traits: Farmer satisfaction, Temp, Milking Speed, Leakage.
 - How: Farmer recording, 1-5 scores, on-sheets (or via web).
 - Number: 5.5k records & 270 herds.
- Health recording
 - Traits: Lameness, Mastitis, Retained Placenta
 - How: Farmer recording, 1-5 scores, on-sheets (or via web)
 - Number: 13k records & 800 herds (high incidence of events e.g., MA (35%), LM (30%) & RP (10%))

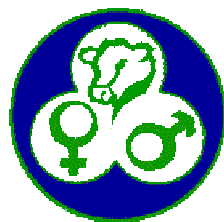
Examples of Records (ii)

- Lameness recording.
 - Traits: Incidence lameness, severity lameness (1-5 scores)
 - How: Technician recording, AI handheld.
 - Number records:
- EDIY milk meters.
 - How: EDIY milk meters.
 - Traits: Milking speed, temperament.
 - Number records: 0 – potential 100k/year.
- Calving performance – Fran
 - Traits: Calving difficulty (%)
 - How: 1-4 scores
 - Number records: 1 million+



Where next?

- Project to evaluate bulls for range of traits of economic importance;
- Options;
 - EV's (& index) for each trait. Include in current sub-index, e.g., Health.
 - One “ease of care index”, i.e., Labour costs associated with; mastitis, lameness, temperament, milking speed, retained placenta, farmer satisfaction....
 - Others?



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Across Breed Evaluations

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Assessment of Breeds

- Implementation of Sampling tool Work of John Hickey
- Assesses criteria for inclusion of a breed on its own: records in evaluation Sinead McParland, Francis, now running at ICBF for beef evaluation
- Extend to Milk, Fertility, Calving

Specific Heterosis Effects

- Two studies nearing completion
- Noreen Begley PhD thesis: Norwegian Red x Holstein Breed and crossbreed effects.
Moorepark, ICBF, UCD
- Mauro Penasa MSc thesis: Heterosis and breed effects in other crosses: HO, FR, MO, JE
University of Padova, Massey University, ICBF
- Both studies indicating heterosis effects across all 5 traits in Milk and Fertility index
- Papers from both studies submitted to peer reviewed journals

Preliminary Results

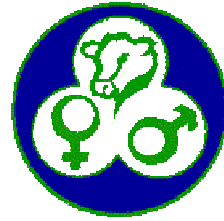
Mauro: First cross heterosis HOxFR
Milk = 193kg, Fat = 9.1kg, Prot =
8kg; Impact €49 Milk Subindex
Calving interval = -1.6 days

Noreen: First cross heterosis HOxNR
Milk = 145kg, Fat = 7.5kg, Prot =
6.6kg = €42 Milk Subindex

Impact

- Implementation of work on breeds and heterosis effects simultaneously
- Facilitate release of culling index

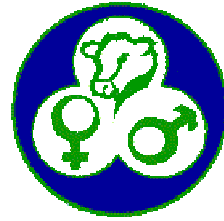




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Updating the EBI

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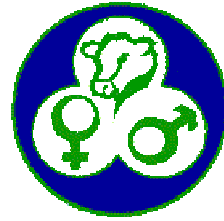
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Genetic Evaluation Schedule

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Plan for 2009

- Official Interbull run dates;
 - Jan 15, April 1, August 19.
 - ICBF “additional” run November 1.
 - AI bulls ~ 1 week after these dates.
 - All animals ~ 3 weeks after these dates.
- Test runs; April 28th and September 8th
 - Development in evaluation work finished by September test run (calving, fertility, longevity + other breeds).
 - Other changes at this stage as well?



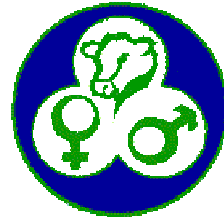
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AI Bull Application Process

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Update

- On-line bull application process.
- Cover ICBF & DAF requirements.
- Spec developed.
- Unfortunately other database development priorities have superseded.
- “On Hold”.



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Breeding for Profit; Best Practice in Cattle Breeding

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Trends in Breeding

Area	Example statistic	2005	2006	2007	2008
AI	Number AI registered dairy replacements	75,000	83,502	98,723	118,045
	Technician recorded inseminations*	N/A	N/A	323,109	350,216
Milk Recording	Number of cows in milk recording	408,456	437,300	458,518	498,321
	Number herds in milk recording	6,041	6,224	6,245	6,567
Herdbooks	Number herdbook registrations	79,108	85,754	87,832	90,000
	Number herdbook members	13,932	14,397	15,787	16,000
ICBF Animal Evaluations	Average EBI of dairy born females	€31	€37	€47	€60
	Average €uro-Star of beef born females	€123	€126	€128	€130
ICBF HerdPlus	Number of Animal Event Registrations	534,997	604,915	607,226	1,253,739
	Number herds on HerdPlus	N/A	1,500	3,000	4,700
GENE IRELAND	Number dairy bulls on progeny test.	21	45	44	72
	Number beef bulls on progeny test.	N/A	10	15	20

* Based on 150 technicians with handhelds across both years.

Plan for 2009

- Element of ICBF strategy for 2009.
- Follow on from successful “Profit with AI” campaign
- Three elements; (i) Journal page, (ii) EBI€100 Discussion Grp, & (iii) Euro-Star Discussion Group.
- No NDP funding; costs of program from beneficiaries.
 - ~€20k for AI sector – costs covered from service fees.
- Sustainable model for future & expand into other areas.