

IRISH CATTLE BREEDING FEDERATION

Fertility – Work in Progress

Andrew Cromie, ICBF
28th April 2009

Overview of Talk.

- The fertility problem.
- ICBF's approaches to date.
- Have we been successful?
- Where next?



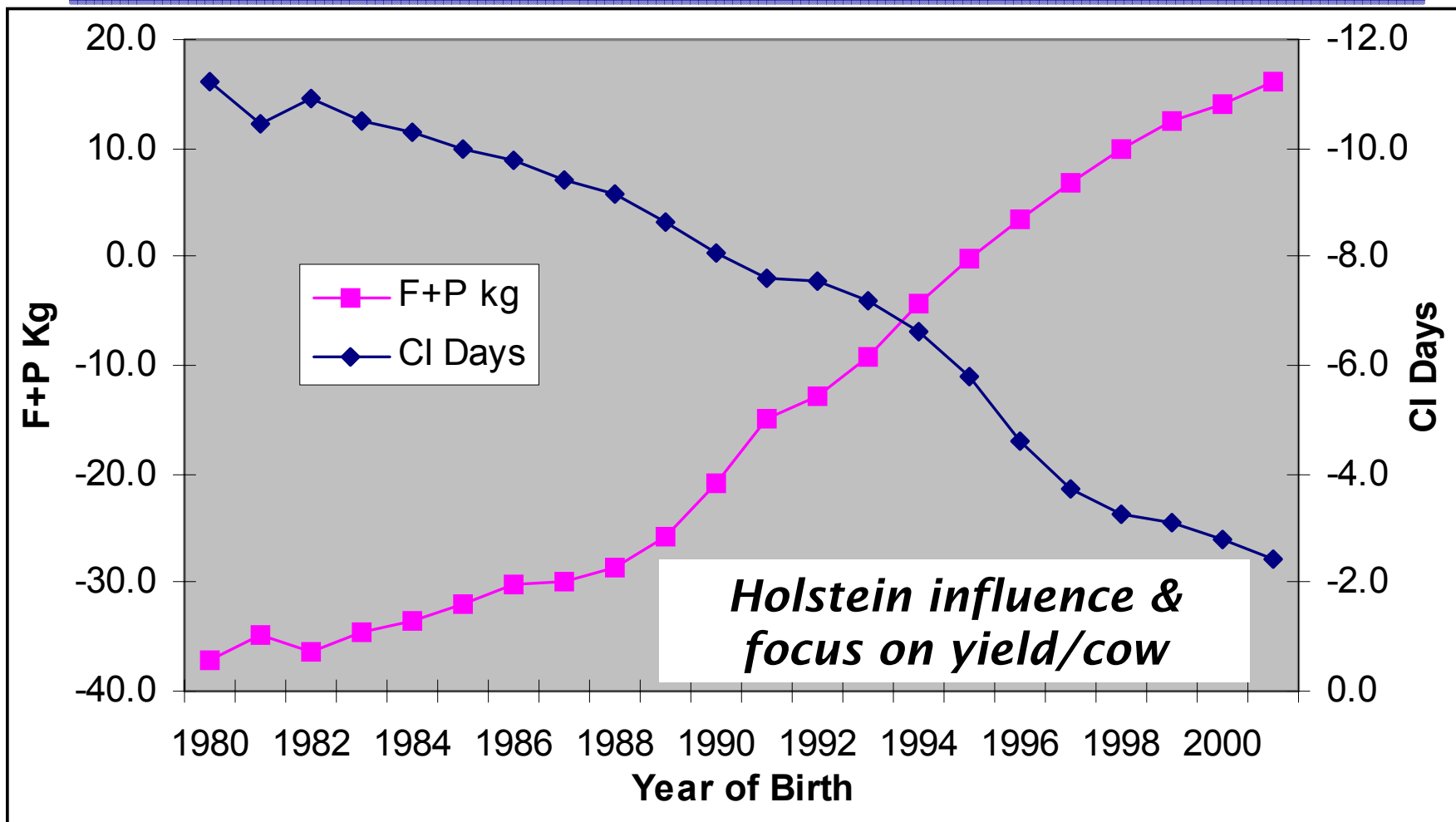
Dairy Cow Fertility – *Key stats from ICBF HerdPlus**

Fertility parameter	Average	Target
Calving Interval	396 days	365 days
6 week calving rate	57%	>80%
Calves/cow/year	83%	>95%
% cows calved in Apr-Jun	25%	<10%
Pregnant to 1st Service	53%	>65%
Replacement rate	25%	18-22%
Involuntary culling rate	15%	<10%
Infertile Rate	9%	<5%

*** Based on data from “better” herds**

- Fertility is number 1 issue for industry (AHI survey and ICBF consultation meetings).
- Infertility is costing Irish dairy farmers €100-€300 million/annum.

How did it happen? *Female Genetic Trends for F+P & CI Days*



High index Holstein route not the answer

Peter Young

Pregnancy to first service for both groups was just 35 per cent

1). This year's fertility results

Very disappointing results from three year trial

EIGHT of the twenty-three empty cows were scanned in calf at 30 days. Embryo loss struck to see the eight repeat near the end of the breeding season.

That's is the hardest pill to swallow for Jack Kennedy, Flor Flynn and the rest of the team that put in huge effort into getting the cows in calf. "It was hugely disappointing. The cows were well fed since they went out day and night on March 10, and they settled very well,"

said Jack. There was just one embryo loss last year. The biggest problem for them, and for all farmers, is that there is still little known in terms of answers.

Feeding more meals is not the solution. The three-year trial clearly shows that there is no effect of feeding level on fertility.

The 96 cows were split into three herds. Each herd contained half-high genetic merit cows (RBI 00 X) and half

Medium merit (RBI 00 Y). The herds were fed either

- 400kg meal (Low concentrates, LC)
- 800kg meal (medium concentrates, MC)
- 1500kg meal (high concentrates HC)

The average infertility rate for the different levels of meal was 23 per cent, 25 per cent and 22 per cent respectively.

answer for helping to select cows with higher fertility.

These cows were bred in Ireland and bought from farmers. The previous high merit cows had been bought in from Holland and France.

"However it shows that nationality has nothing to do with it. The results clearly show that poorer fertility is linked to high index Holstein percentage, in the cows

Jack Kennedy

overseas

where based Dillon. "We answer season allow t spread option,

Table 2

	Current trial (1998-2000)		Previous trial (1995-1997)	
	HGI	MGI	HGI	MGI
Submitted in 1st 3 weeks (%)	88	90		
Calving to service interval (days)	77	77	70	71
Calving to conception interval (days)	93	90	86	88
Pregnancy 1st service (%)	49	57	41	53
Pregnancy 2nd service (%)	42	44	37	58
Services/cow	1.83	1.68	1.75	1.7
Infertile rate (%)	17	12	23	6
Percentage Holstein (%)	80	60	92	52

Measures of fertility needed in index

IRISH farmers desperately need an Index that includes measures of fertility.

The Moorepark research increases the urgency of the new index being drawn up by the ICBF and due to be released in late November.

For the first time the index will be produced that will include traits linked to fertility.

"Other countries are starting to record traits that are linked to fertility. With our compact calving system the need in Ireland is much greater," said ICBF geneticist Dr.

infertility.

Table 1
Milk production for medium and high merit cows (1998-2000)

	High merit	Medium merit
1998	1,498	1,213
1999	1,675	1,464
2000	1,770	1,564

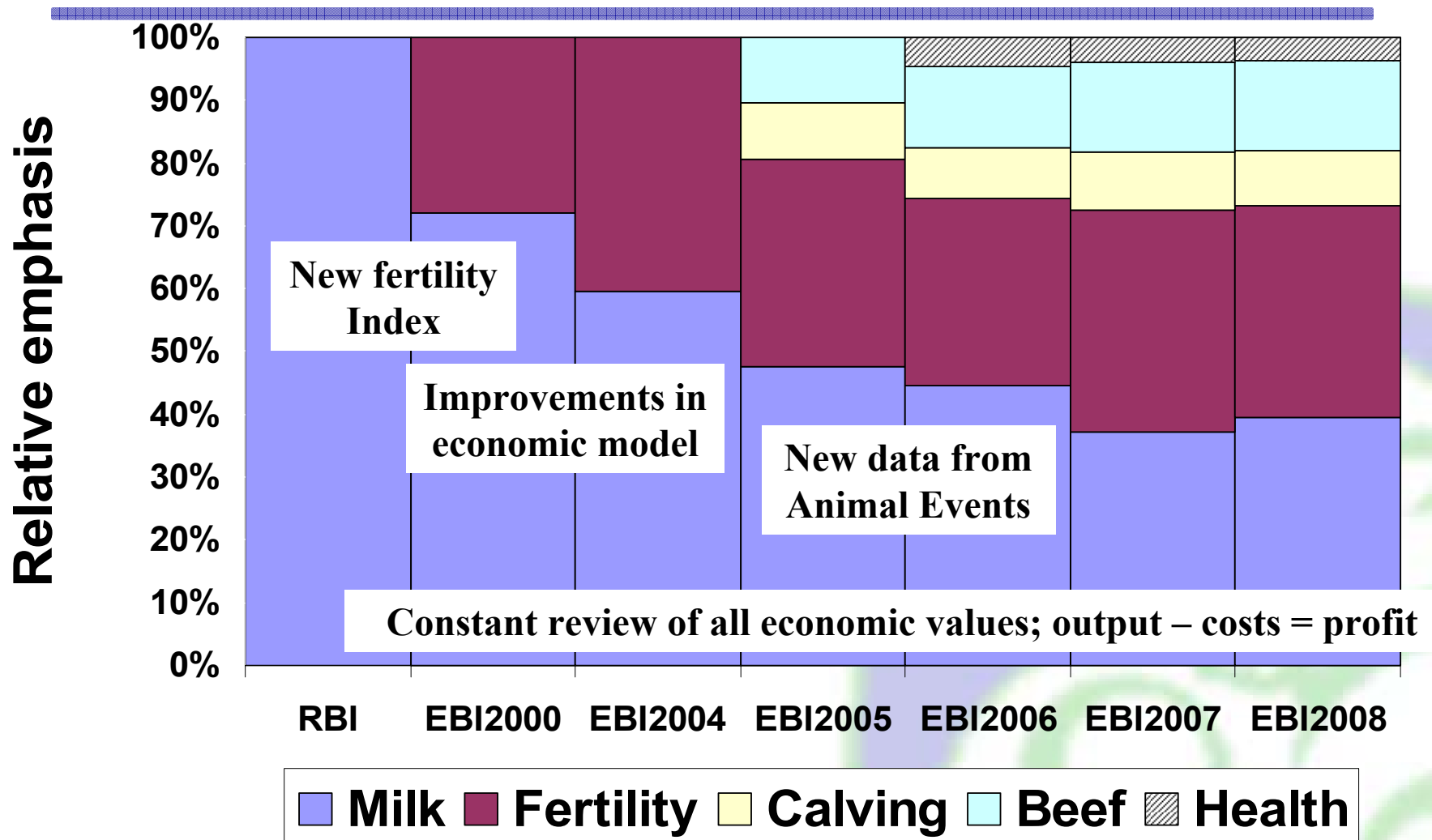
ICBF & The Inherited Problem!

- What should ICBF do?
- Fertility traits lowly heritable...other options (nutrition, physiology.....) pursued.
- But....
- There was genetic variation in fertility.
- Some countries did not have a fertility problem – those with composite economic indexes, e.g., Norway, Sweden, Finland...
- If breeding created the problem, surely it could also solve it!

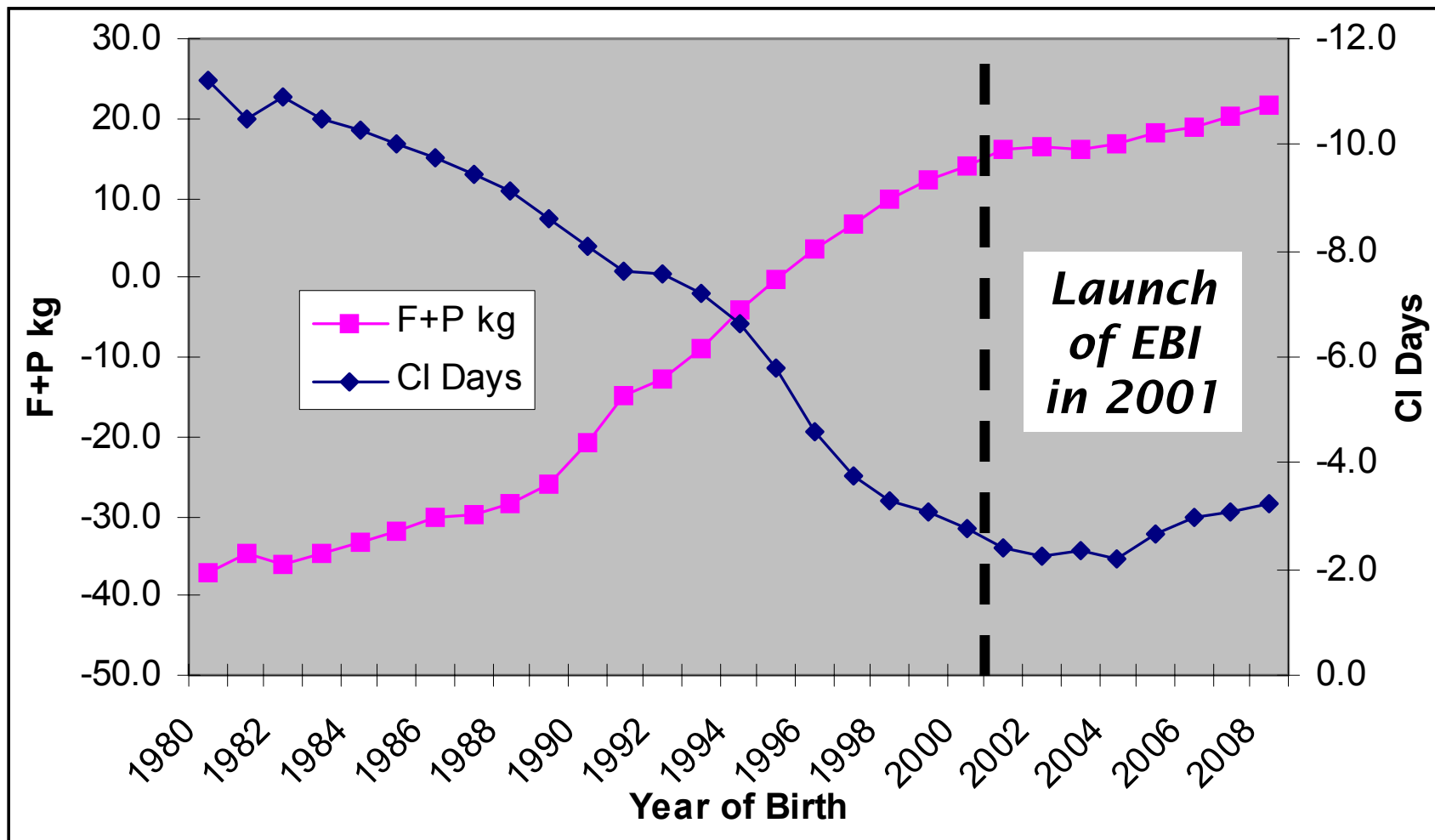
EBI Project; 2000

- Project team established in 2000.
 - ICBF (Andrew Cromie), Teagasc (Pat Dillon), ID-Lelystad (Roel Veerkamp), & NULS (Theo Meuwissen).
- Key deliverables;
 - New fertility index (based on calving dates)
 - New Economic Breeding Index (EBI) including milk & fertility traits (based on Moorepark farm economic model)
 - New breeding program for Irish industry.
- Extensive collaboration & interaction with industry.
- Launched 2001.

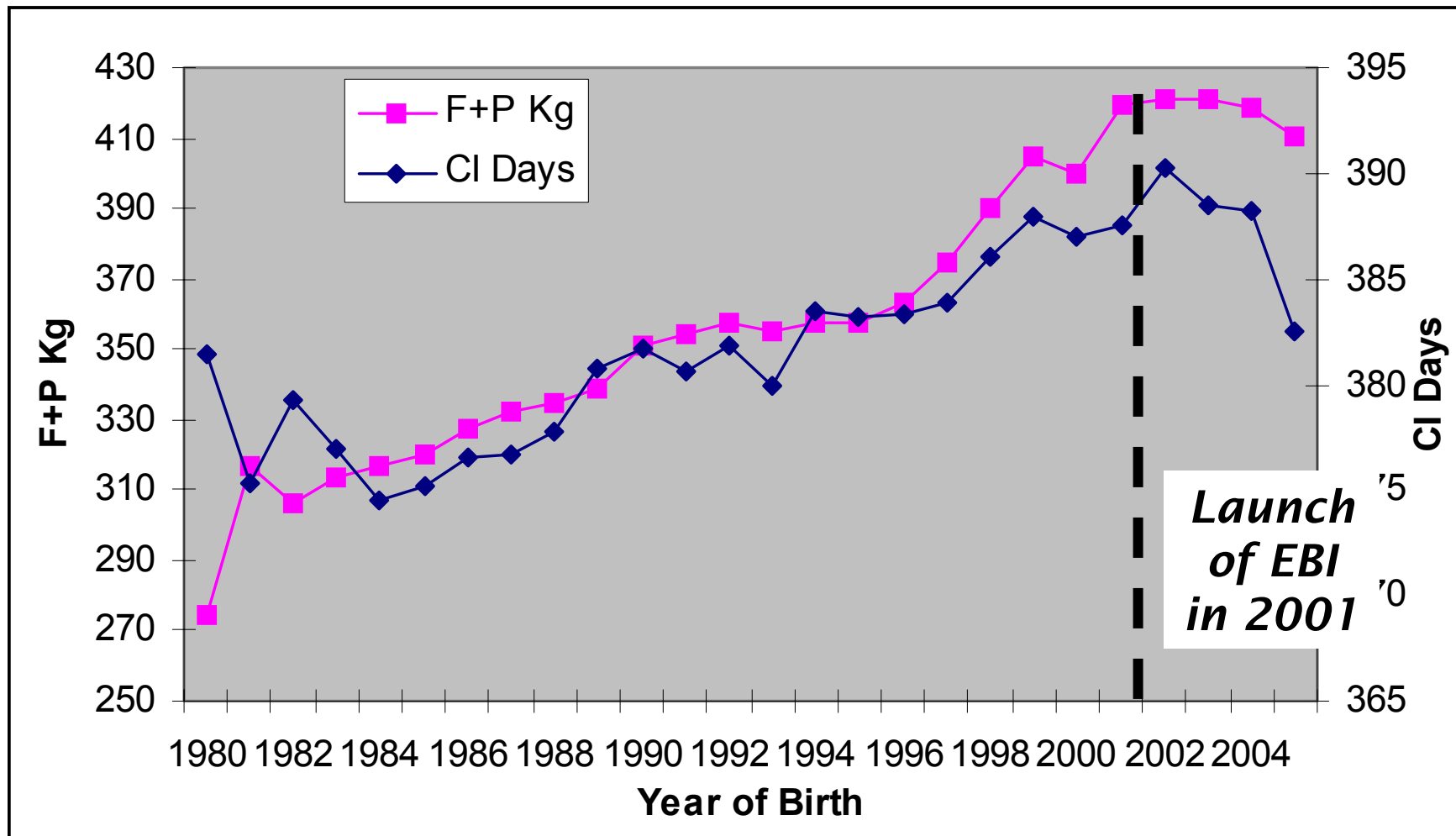
Evolution of the EBI (2000+)



The up to date picture? *Female Genetic Trends for F+P & CI Days*



Phenotypic Trends; *F+P kg* & *CI Days* (Heifer Data).



The EBI Story; *A successful template.*

- Good Basic Science.
 - Key papers; EBI for seasonal systems & fertility indexes (2002)....Veerkamp, Olori...
 - Subsequent papers & conferences.... Hickey, Berry, Evans, Kearney...
- Good Applied Research.
 - Independent verification studies (Teagasc Moorepark & Teagasc Dairy Profit Monitor).....Buckley, Kennedy, Horan, McCarthy, Ramsbottom.
- Good Industry Uptake
 - Positive genetic & phenotypic trends.....but we need more....

Where next?

- Genomics & Fertility
 - Increased accuracy of evaluations.
 - Increased genetic gain.
- New phenotypic data.
 - Use of insemination data.
- New genotypic data.
 - The “Oman” effect & genes for fertility?
- A more integrated approach.

i. Genomics & Fertility.

- Just launched in Spring 2009.
- High correlations (0.70) between genomic data and actual performance.
- Genetic gains will accelerate – especially for fertility traits.

Bull Details					EBI & Proof Details				EBI Sub Indexes				
Rk	Code	Name of Bull	Sire	Hol	EBI	Rel	Range	Proof	Milk	Fert	Calv	Beef	Hlth
1	OJI	O-BEE MANFRED JUSTICE	HCM	100	€250	91%	+/-€35	DP-IRL	€114	€86	€49	-€6	€7
2	RXO	RAMOS	SRH	100	€216	74%	+/-€60	DP-INT	€47	€120	€38	-€6	€16
3	HTH	HAZAE L LIGHT DETECTOR S2F*	LGI	71	€198	43%	+/-€89	GS	€84	€114	€25	-€23	-€2
4	OLG	BALLIVOR OLYMPIC GOLD ET	OJ	100	€194	50%	+/-€83	GS	€127	€32	€40	-€5	€1
5	BYJ	BALLYDEHOB JUSTICE	OJ	96	€189	53%	+/-€81	GS	€90	€76	€28	-€7	€1
6	HZL	HILLSDALE LIONEL	RUU	91	€188	57%	+/-€77	GS	€71	€68	€50	-€1	€1

ii. More Accurate Fertility Evaluations

- AI handheld systems now operating on farms.
- Recent analysis of 1 million insemination records.
- Heritability estimates;
 - Calving to 1st Service (6%).
- Potential use of these traits as “early” predictors of fertility.
- Increase accuracy of evaluation



iii. The “Oman” Effect

ICBF BULL SEARCH - Windows Internet Explorer

http://www.icbf.com/taurus/bull_search/index.php?ani_id=229599768&target=d_fertility

Google Search

ICBF BULL SEARCH

ICBF Genetic Evaluations Service

Search Again

Fertility Sub Index Information

AI Code: OJI Breed: HO (100%) Sire: [HAHO CUBBY MANFRED / HCM](#)

Animal Name: O-BEE MANFRED JUSTICE Owner: EUROGENE AI BULLS Dam: MEIER-MEADOWS EL JEZEBEL ET / 6515459080

Date of Birth: 08-MAR-1998 Date of Evaluation: April 2009 MGS: [EMPRISE BELL ELTON / 6501912270](#)

National ID: International ID: HOLUSAM000122358313

EBI Summary Milk Fertility Calving Beef

Health Type Pedigree Prev Eval

Compare Evaluations

INDEX INFORMATION AND PREDICTED TRANSMITTING ABILITIES (PTA)

Date of Evaluation	Fertility (€)	Rel (%)	CI (days)	Survival (%)
April 2009	112	87	-5.06	4.63

Sire Progeny and Progeny Herdmate Information

Date of Evaluation	Hrd	Dau	Herd Mates	Average CI		Average Survival	
				Dau	Herd Mates	Dau	Herd Mates
April 2009	252	82	348	372	390	87	81

Calving Interval and Survival Records

	Parity 1	Parity 2	Parity 3
No. Daughters	250	123	18
No. Herds	82	58	14
No. Censored	118	100	15

Number of IRL Daughters: 252

Number of IRL Herds: 82

Type of Proof: INTERBULL

Interbull Daughter Distribution

Country	Fertility		Survival	
	Daughters	Herds	Daughters	Herds
AUS			0	0
FRA	1484	870	1630	1045
DFS	1576	680	998	532
USA	29203	3938	23944	3438
NZL	132	39	131	31
GBR	38	38	190	49
CAN	112	36	537	110
GER	86	32	94	38
ITA	705	281	1760	476
NLD	228	127	838	271

» Top Of Page » Contact Support » Disclaimer

Done

start

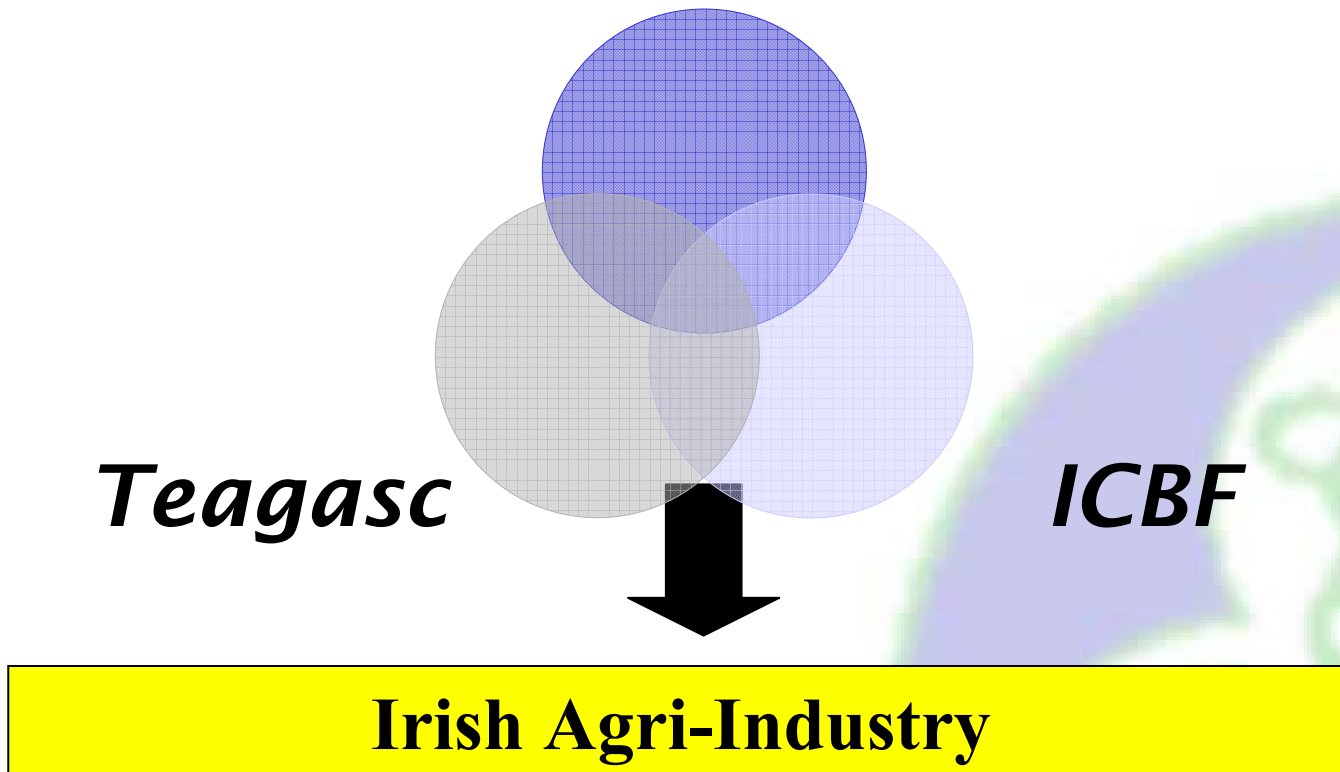
4 Microsoft Offic... Vodafone Mobile ... Fertility_Work_in... Dev_dairy_breedi... ICAR_meeting_17... ICBF BULL SEARCH... Scientific Common... EN

Internet 100%

13:06

iv. A More Integrated Approach

Irish Universities



What about beef & sheep?

- ICBF have a strong philosophy of building systems that will operate across breeds & species.
 - Fertility are key issues in beef & sheep production.
 - Negative genetic & phenotypic trends are apparent.
- Much “cross-pollination” from an integrated approach across farm animals.

Summary.

- Infertility is the major cost on Irish farms.
- Introduction of the EBI (& fertility indexes) has halted the decline in fertility performance.
- Improving fertility performance is the key goal for future.
- Excellent opportunities for a more integrated approach to animal breeding.