



IRISH CATTLE BREEDING FEDERATION

Strategies for Sustainable Success; The right cow to drive performance.



Dr Andrew Cromie, ICBF.



Do you know this cow?



Overview.

- Development of the EBI.
- Industry uptake in EBI.
- Does the EBI work?
- Role of Genomics.
- Summary

Fertility Crisis -> Development of EBI.

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

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 (%)	88	60	92	52

Measures of fertility needed in index

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

Jack Kennedy
Moorepark
where based
Dillon.
"We
answer
season
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spread
option,

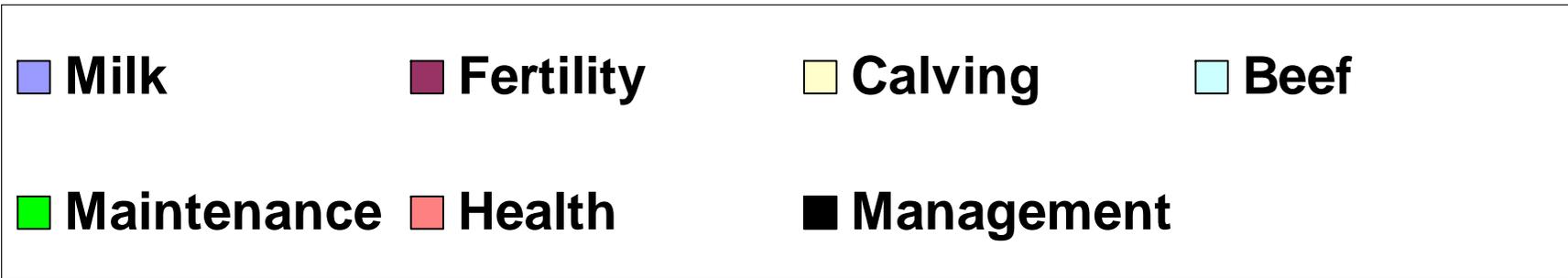
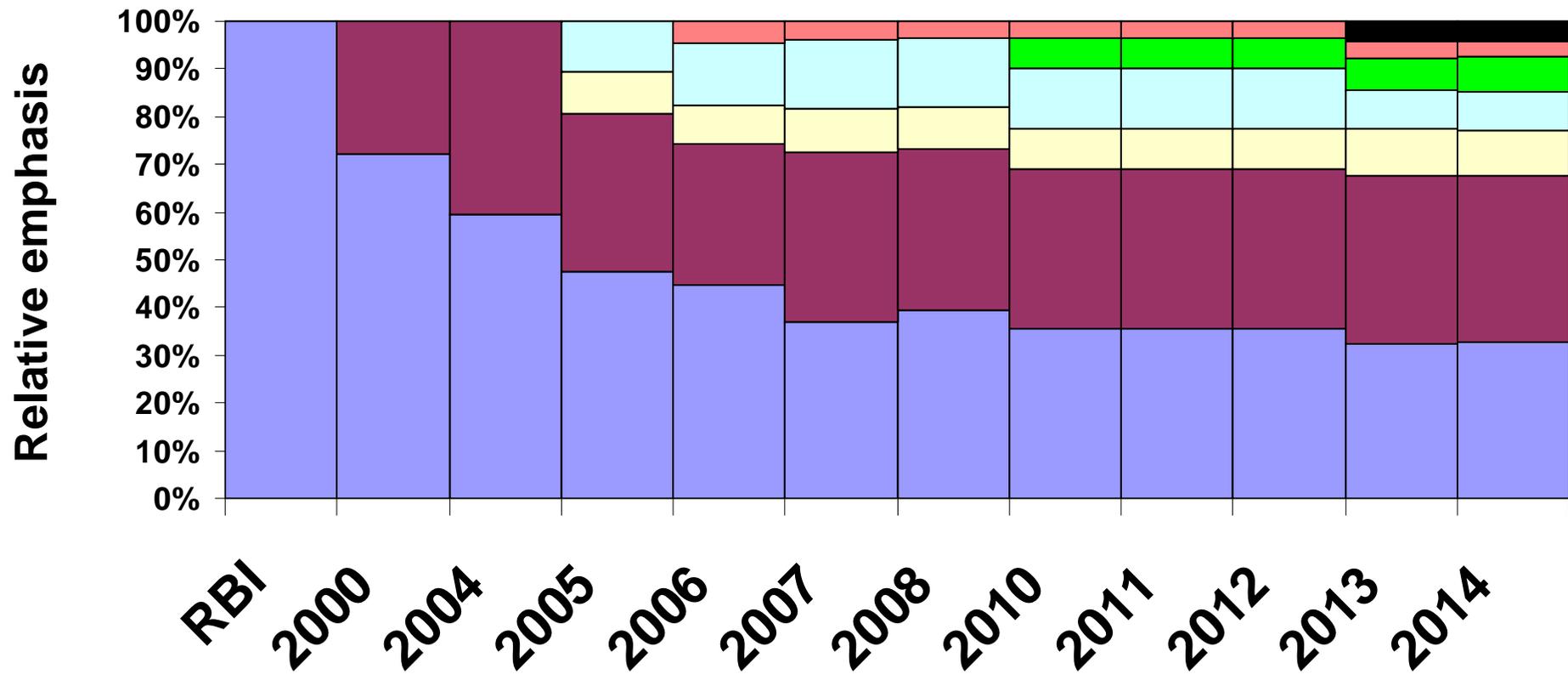
IRISH farmers desperately need an Index that includes measures of fertility.

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.

Development of EBI; 2000-2014



Industry Uptake in EBI.

OPEN DAY
2006 EBI €100
Award Winner



ON THE FARM OF
 Jim and Pauline Delahunty
 Ballykinash
 Carraig
 Via Birr
 Co. Tipperary

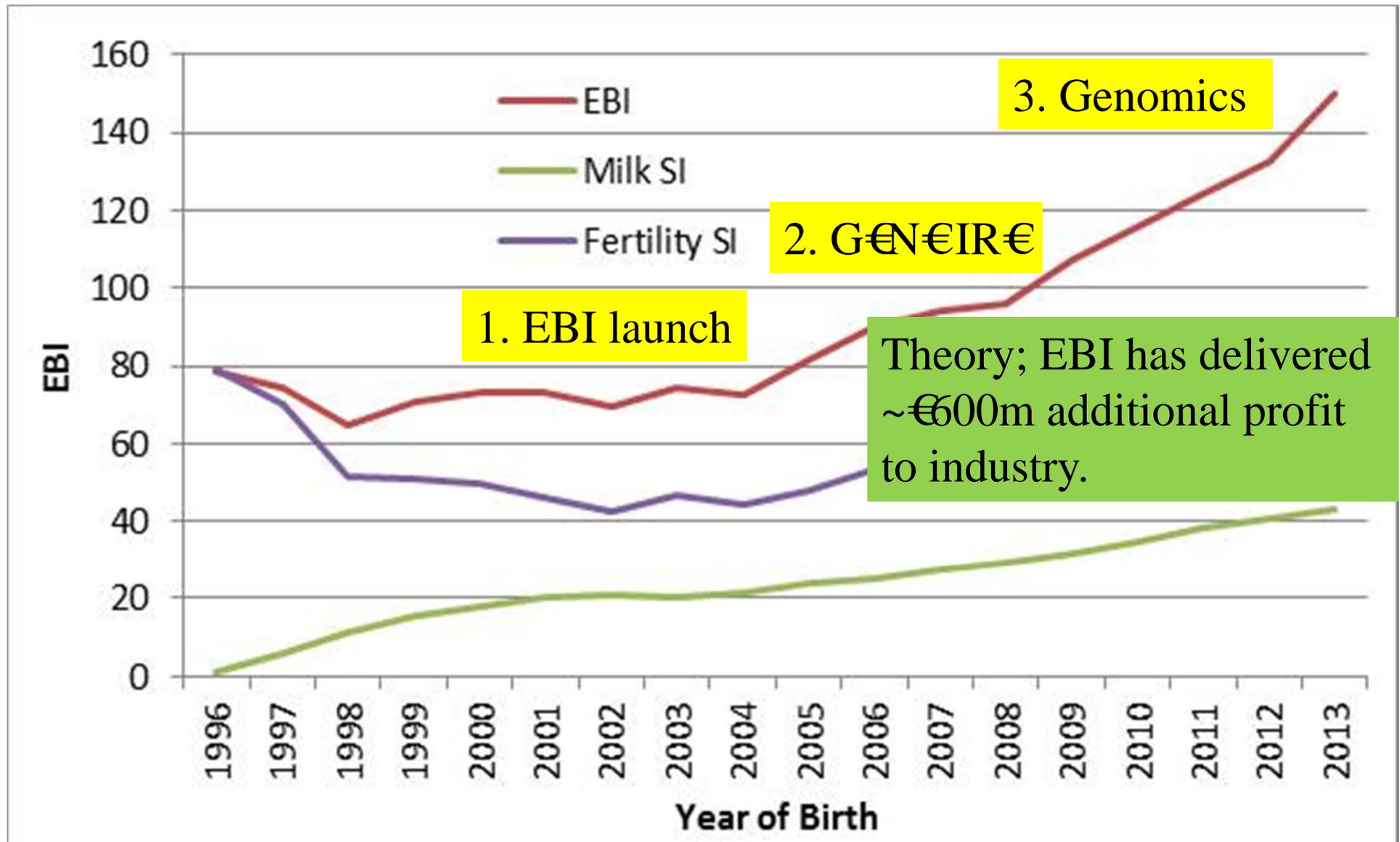
Wednesday, 13 September, 2006
 10.30 am – 3.00 pm

ACCBANK   

	EBI	Milk kg	Fat kg (%)	Pr kg (%)	CI	
High group EBI	€100	5,740	232 (4.05)	217 (3.75)	365	
Bottom group EBI	€34	5,730	215 (3.75)	207 (3.62)	379	
Difference	€66	+ 10	+ 17	+ 10	-14	Total
Value		- €1	€26	€52	€99	€176

- Slow start; Change!
- EBI competition; Took off.
- GEN€ IR€ & Genomics.

Genetic Trends in EBI.



Has the EBI worked?

- Data from ~6000 DEP herds.
- 95,395 Spring 2008 born heifer calves.
- Ranked on EBI, based on “Parent Average EBI” (Feb 2010 evaluation).
- How have they performed for; (i) age 1st calving, (ii) CI days, (iii) Survival & (iv) Milk solids yield?

Comparison of EBI.

Table 1. Average EBI, milk and fertility sub-index, by EBI group*

EBI Group	Animals	EBI	Rel	Milk SI	Fertility SI
Top 20%	18207	€123.9	22%	€42.8	€65.4
21-40%	18207	€97.7	25%	€34.6	€52.0
41-60%	18207	€79.2	27%	€30.8	€40.2
61-80%	18207	€60.0	28%	€27.9	€27.2
Btm 20%	18207	€21.7	29%	€24.4	-€1.1
None	4361				
Grand Total	95396	€76.5	26%	€32.1	€36.7

* Based on parent average EBI.

- EBI predicts $€102 * 2 = €204$ more €/lactation.

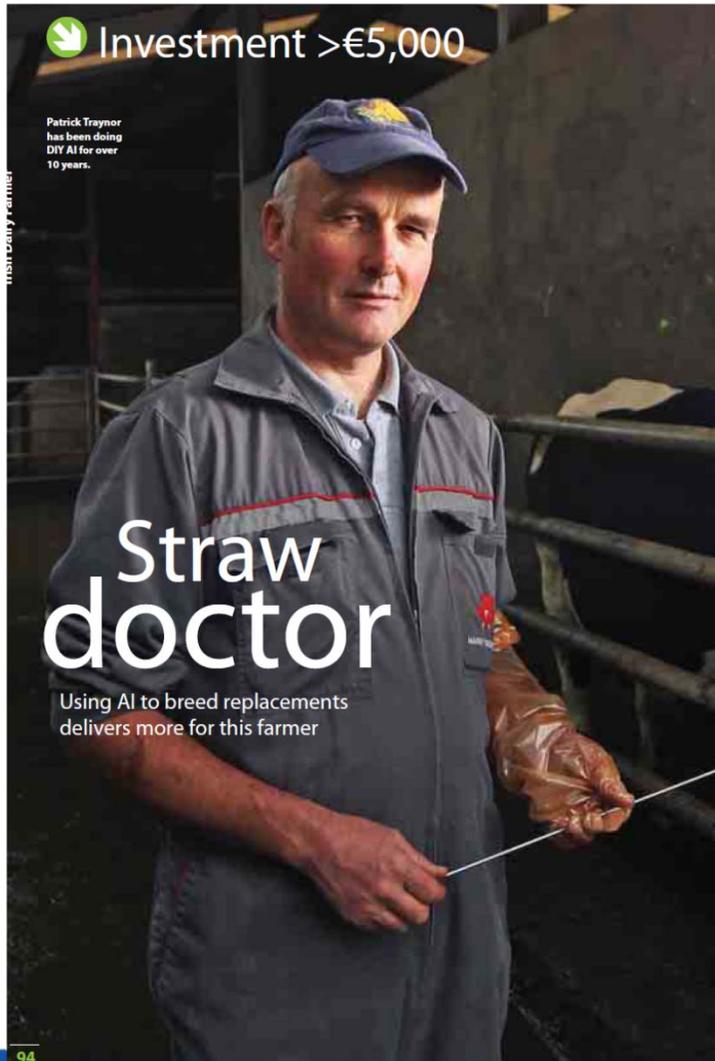
MS & Fertility Performance.

Table 2. Comparison of fert and MS for Spring calving herds, by EBI group.

EBI Group	Age 1st calving	CI Days (1-2)	Surv% (1-3)	Milk solids (1-3)
Top 20%	25.2	388.8	65.3%	1034.2
21-40%	25.6	390.7	64.0%	1009.7
41-60%	26.0	393.4	61.6%	991.0
61-80%	26.3	395.3	59.7%	972.2
Btm 20%	27.3	401.7	52.3%	941.6
No EBI	27.1	389.0	71.0%	838.5
Overall	26.3	393.2	62.3%	964.5

- Profit from EBI = [(12.9 CI days * €12) + (4.3% * €12) + (92.5 kg MS * ~€4)] = **€576**. Similar to €204/lactation (or **€612** over 3 lactations).

Has the EBI worked- Yes!



- Industry has “got the EBI message”.
 - High EBI bull teams of bulls (€270+)
 - > 35 AI bred heifers/100 COWS.
 - Select replacements on EBI.
- Can we improve further?

The potential of genomics.

- Use of DNA data (in addition to parent average) to more accurately identify more profitable animals.
 - “Parent Average” EBI reliability = 26%
 - Genomic EBI reliability = 54%.
 - Equivalent to having ~15 lactation records.
- Genomics now used widely in bull breeding decisions.
- Not used in females. Why?.....

Genotyping Females.

- ~8,970 genotyped to date.
 - 2,105 females born in 2012.
 - 47 farmers genotyped > 20 females.
 - US genotyped 150k females last year!
- Not that surprising.....
 - Cost:benefits not fully understood.
 - Genomics for other dairy breeds.
 - No major push!

Does genomics work?

- Data from ~6000 DEP herds.
- 1,455 heifers, with genotypes and with a completed first lactation.
- Ranked on EBI, based on; (i) "Parent Average EBI" (Feb 2011 evaluation) and (ii) Genomic EBI (latest evaluation).
- How have they performed for; (i) age 1st calving, (ii) CI days, (iii) Survival & (iv) Milk solids yield?

Comparison of PA & Gen EBI.

Table 3. Comparison of animals ranked on basis of PA EBI & Genomic EBI.

Parent Average EBI	Genomic EBI					Overall
	Btm 20%	61-80%	41-60%	21-40%	Top20%	
Btm 20%	175	58	42	10	7	292
61-80%	61	90	70	43	27	291
41-60%	31	70	73	69	48	291
21-40%	14	56	64	90	66	290
Top20%	7	18	43	80	143	291
Overall	288	292	292	292	291	1455

- Only 49% of animals ranked top 20% for both PA EBI & Gen EBI ($r=0.69$).

Gen EBI; Fertility & MS kg.

Table 5. Comparison of fertility and MS performance, by EBI group*

EBI Group	EBI	CI 1-2 days	SU% (1-2)	Average F+P kg
Top 20%	€222	374.0	89%	380.1
21-40%	€184	372.4	86%	379.6
41-60%	€155	373.7	82%	381.6
61-80%	€125	372.1	80%	372.0
Btm 20%	€66	378.5	79%	363.5
Overall	€150	374.1	83%	375.4

* Animals ranked on genomic EBI. Data from spring calving herds only.

- Gen EBI predicts +€312/lactation, actual is €240. PA produced €126. **Gen EBI is more accurate.**

Cost:benefits of genotyping

DATA EXTRACTED: 10/10/2010

1. EBI Herd Summary

Average EBI for all dairy cows with; (i) a known sire (or milk recorded progeny with a known sire) and (ii) are currently on your farm.

* Number of animals that are missing an EBI result

Animal Group	Num of Cows	Milk Kg Fat Prot	% %	Surv% CI Days	Milk % Cont	Fertility % Cont	Calv % Cont	Beef % Cont	Maint % Cont	Mgmt % Cont	Health % Cont	EBI €
Cows with EBI	125	172			€ 54	€ 84	€ 27	€ -4	€ 4	€ 3	€ 0	€ 168
Missing EBI*	0	11.6	0.10	2.5	30.4%	47.4%	15.2%	-2.4%	2.4%	1.8%	-0.3%	
Total Cows	125	9.3	0.07	-4.6								

- Downing, IGA Dairy Conf 2011.
 - 3:1 Return on Investment.
- Cost of genotyping females = €1440.
 - 48 genotyped @ €30 = €1440.
- Benefits of genotyping = € 4,500.
 - 38 genotyped @ €50 * 2 * 4.5 lact.
- Actual performance = 431 kg MS, CI = 373 days & 90% Survival **(3:1 RoI is being confirmed)**.

€ 196
€ 165
€ 164
€ 164
€ 139

User feedback.

- More accurate selection of replacements;
 - Progeny of stock bulls!
- Correcting parentage errors (10-15%)
- Identification of exceptional high EBI COWS.

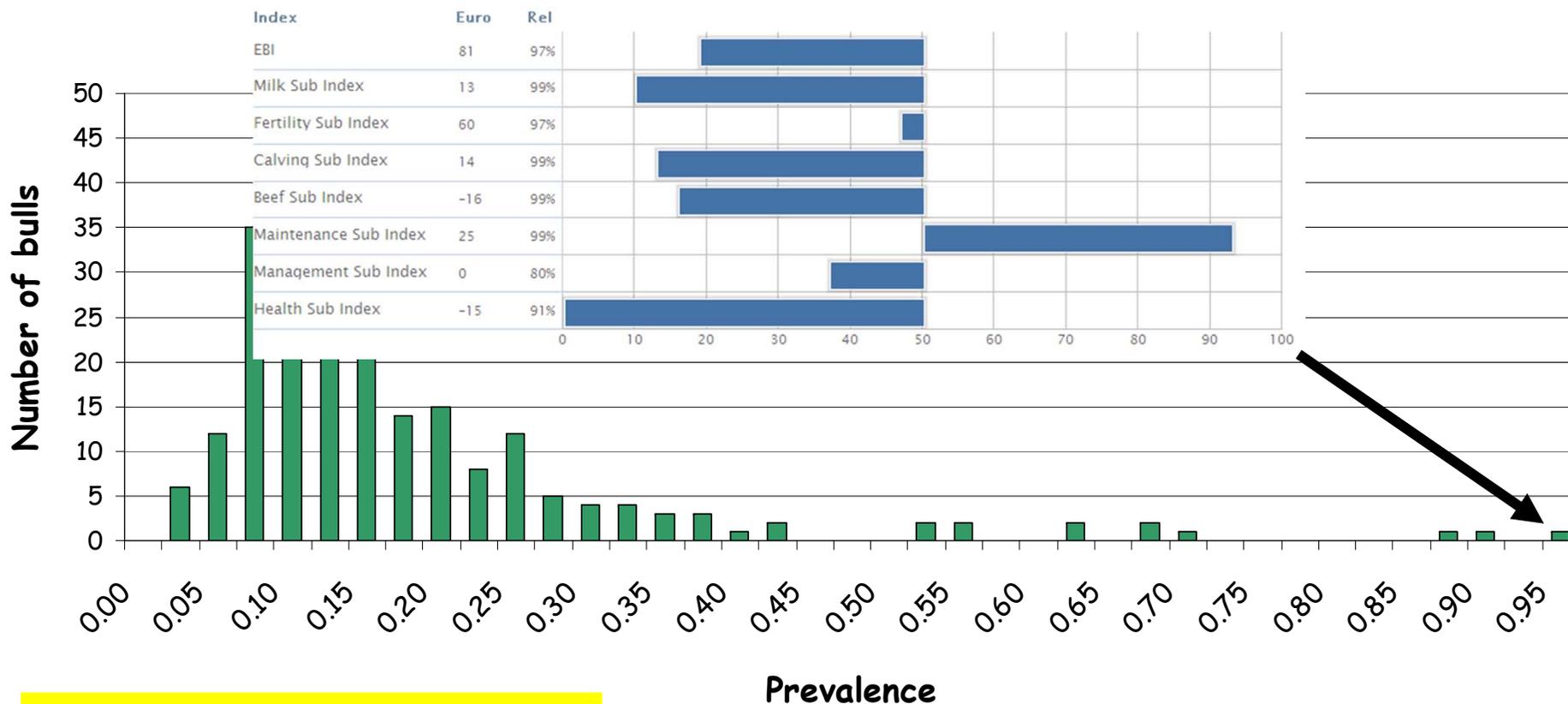
Other benefits – Future.

- Future calf registration process.
 - Tissue tag -> registration -> sire + dam identified -> passport.
- Genomic mating plans.
 - Cow genotype * sire genotype – customised mating.
 - Strengths/weaknesses, inbreeding, major genes
- Sexed semen + genomics for females.
- Increased genetic gain; +50%.

Are we moving too fast?

- NO!
- Establishment of the Next Generation Dairy at Teagasc moorepark;
 - High EBI group (€230), compared with National average (€120).
 - Monitoring of “hard to measure” traits, e.g., MA, LM, Feed, GHG....
- Health & disease traits. Watch this space!

TB - sire prevalence



Heritability = 18%

Ian Richardson

Genomics for Female Service.

- Target of €30/female for 2014.
 - Holstein Friesian females.
- Genomics for other dairy breeds.
 - Informative cows on each farm as part of training population work.
- Relevant for all herds.
 - Selling surplus heifers & expanding.
- Register your interest by contacting ICBF HerdPlus – 1850 600 900.

Do you have one of these cows?

- Genotyped as part of Crookstown Genomics project.
- UYC * GMI * MAU.
- EBI = €345. Rel 56%. Up from €167.
- 5th lactation. Calved 22 Feb (CI = 371 days). 2,700 kg MS to-date (~570 kg/lactation).



Summary - Your next investment?

- EBI & genomics are simple, proven technologies.
 - They have added ~€600m additional profit to Irish dairy farmers.
 - 3:1 return on investment (AI sires and **NOW genomics for females**).

- Decide today to start genotyping your dairy herd; calves, heifers, cows.....
- Contact ICBF HerdPlus for more information.

Best investment or wasted money?

JACK KENNEDY
DAIRY EDITOR

Earlier this year we sent out a questionnaire to over 50 dairy farmers, scattered right across the country, asking them what they classed as their best on-farm investment.

We asked them to think about how they would justify their decisions if asked. We left it wide open to them to justify their selections on the basis of money saved, money made, time saved or simply because it made work easier.

To help differentiate between big and small, we asked them for their 'best on farm investment' that cost: (1) less than €5,000 and, (2) greater than €5,000. It could be large or small - a person, animal, machine, building, labour-saving tool or something completely different and specific to their farm.

The results of the survey are detailed in the new issue of *Irish Dairy Farmer*. All farmers have a 'to do' list, and a 'wish' list. It is fair to say the focus of what farmers have chosen in this magazine is more on the 'to do' list rather than the 'wish' list. They have selected investments that are making their work life balance better, that are making them more money or investments which are essential if they want to stay in business.

The range of investments identified by farmers shows the depth and level of investment that is required by a working dairy farm. The challenge for a dairy farmer is to try and prioritise the investment in the order of what investment is required and essential to generate farm income. What is not possible must hold for another year because as we all know it is not possible to do all farm investment in the first year.

Kerry dairy farmer Conor Creedon suggests farm roadway maintenance is his best farm investment. Conor has invested in very good farm roadways to allow him access grazing on his Rath-

more farm. Now he suggests that annual maintenance of these roadways is one of the most important investments he can make.

SOIL FERTILITY
Soil fertility is important for Louth dairy farmer Karl Cooney and if he wants to hold a high stocking rate then he knows he must aim to increase the fertility of his former tillage farm. For Karl his best investment is improving soil fertility to maximise grass growth.

Meath farmer Mark Cassidy suggests three way drafting is his best on farm investment so far valued over €5,000.

For his nomination for less than €5,000 he selected a new milk pumping system which he installed to pump whole milk from the dairy to the calf house.

Cork dairy farmer Pat Cronin suggests the extension and upgrade to his six-unit parlour was his best on farm investment. Since he upgraded to a 12 unit parlour it has made milking more enjoyable, cows are more comfortable and he spends at least an hour per day less in the milking parlour.

To learn more about some of these investments and how they impacted on farm cash flow, etc, pick up your copy of the *Irish Dairy Farmer* magazine in shops nationwide for €4.99 from next Thursday 7 November.

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