

National AI Program

***Sire Selection, Progeny Testing &
International Partners.***

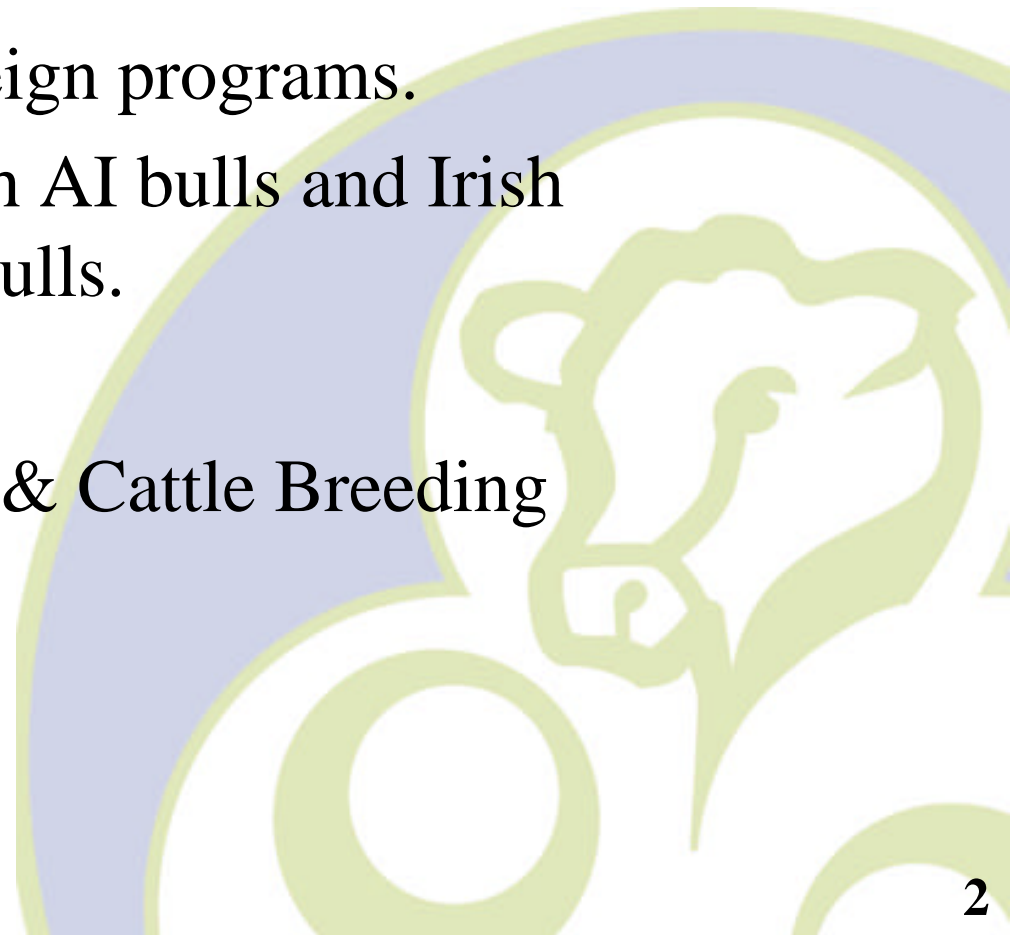
Andrew Cromie, ICBF.

ICBF Dairy Conference, Silversprings Hotel, Cork.

Wednesday 4th February 2004.

Overview

- Background
- Selection of Bulls;
 - Evaluation of foreign programs.
 - Evaluation of Irish AI bulls and Irish pedigree (stock) bulls.
- Selection of Herds.
- Benefits for Farmers & Cattle Breeding Industry?
- Making it Happen?



Background

- Dairy Breeding Objectives and Programs for Ireland – *Veerkamp et al., Nov 2000*
 - New index – EBI (€) – “identifying the best”
 - Launched February 2001
 - Optimal breeding programme – “ensuring the best are used widely throughout industry”
 - 100 bulls with 100 daughters
 - Genetic gain of €22.7/cow/year
 - ***Can Irish bulls compete with best of foreign programs?***
 - ***Cost/benefit of progeny testing?***

*Evaluation of Foreign Programs**

	2004	2005	2006	2007	Totals
Altapon	76	56	52	29	213
CRI	124	232	187	193	736
Gen Australia	188	189	149	76	602
Genus ABS	343	330	344	335	1,352
CR Delta	333	300	282	167	1,082
LIC		153	188	151	492
Semex	392	299	341	171	1,203
Sersia	532	526	505	480	2,043
Totals	1,988	2,085	2,048	1,602	7,723

**Based on sires with proofs for sire & MGS*

- High level of co-operation from foreign programs
- Foreign programs grouped together.
- Compared against ;
 - Bulls in current Irish AI program (Irish AI)
 - Pedigree stock/young bulls (PED bulls)

Foreign vs. Irish Bulls (EBI)

Year 1st proof	Foreign Bulls		Irish AI Bulls		Irish PED Bulls	
	Bulls	EBI	Bulls	EBI	Bulls	EBI
2004	100	€49.3	61	€25.3	100	€35.7
2005	100	€52.6	36	€20.9	100	€44.3
2006	100	€56.0	57	€28.9	100	€52.1
2007	100	€58.3	30	€33.1	100	€59.8
2008			20	€33.4	100	€62.7

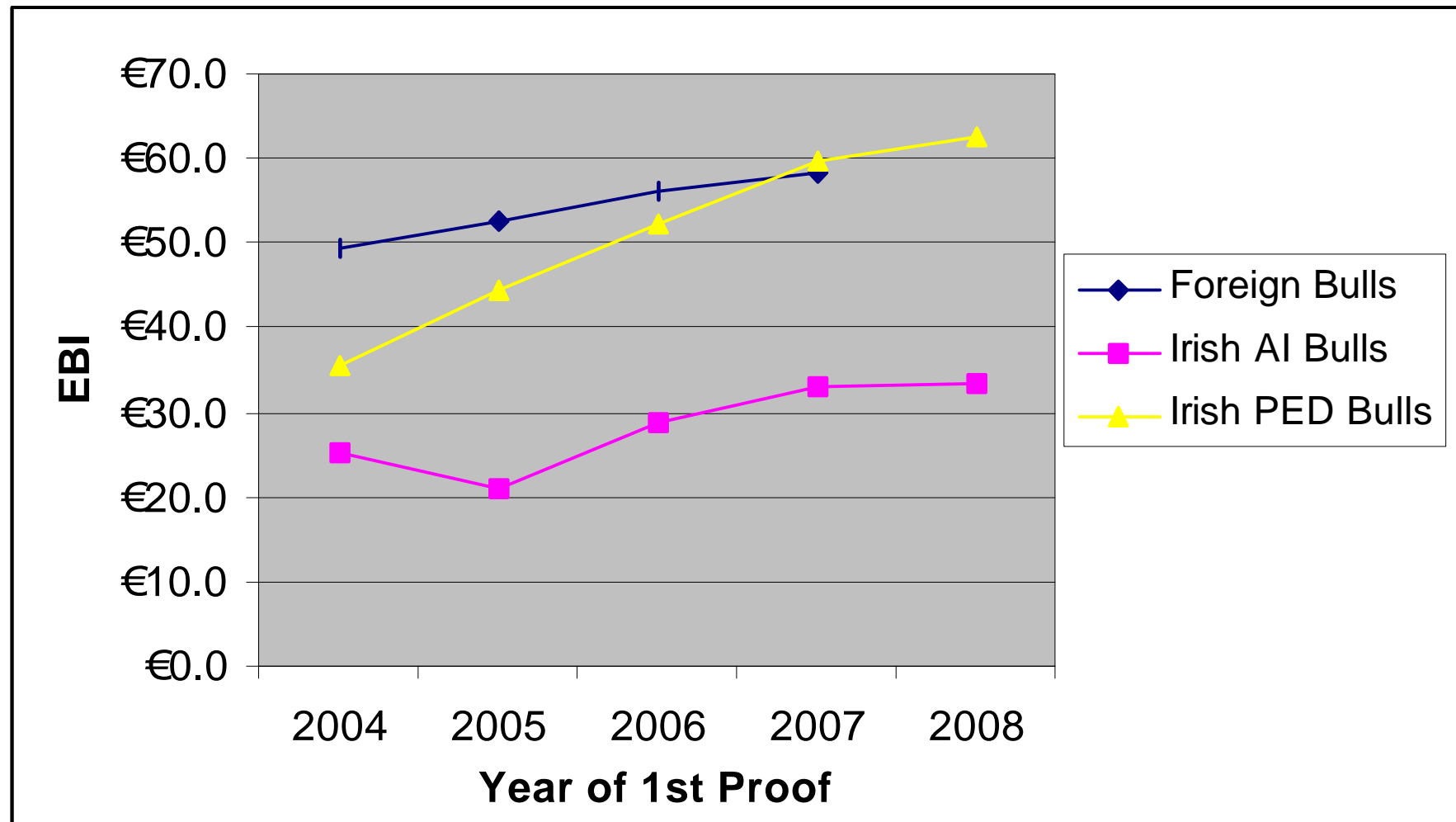
- Comparison of top 100 sires/year from each program
- “Parent Average” proofs calculated based on ($\frac{1}{2}$ sire + $\frac{1}{4}$ MGS + $\frac{1}{8}$ MGGS)
- Irish PED bulls ahead of foreign programs and bulls in current AI program (inc. stock bulls in 04/05/06)
- Top 100 bulls in 2007 = 60 Irish PED, 1 Irish AI, 39 Imported.

Foreign vs. Irish Bulls (P% and CI)

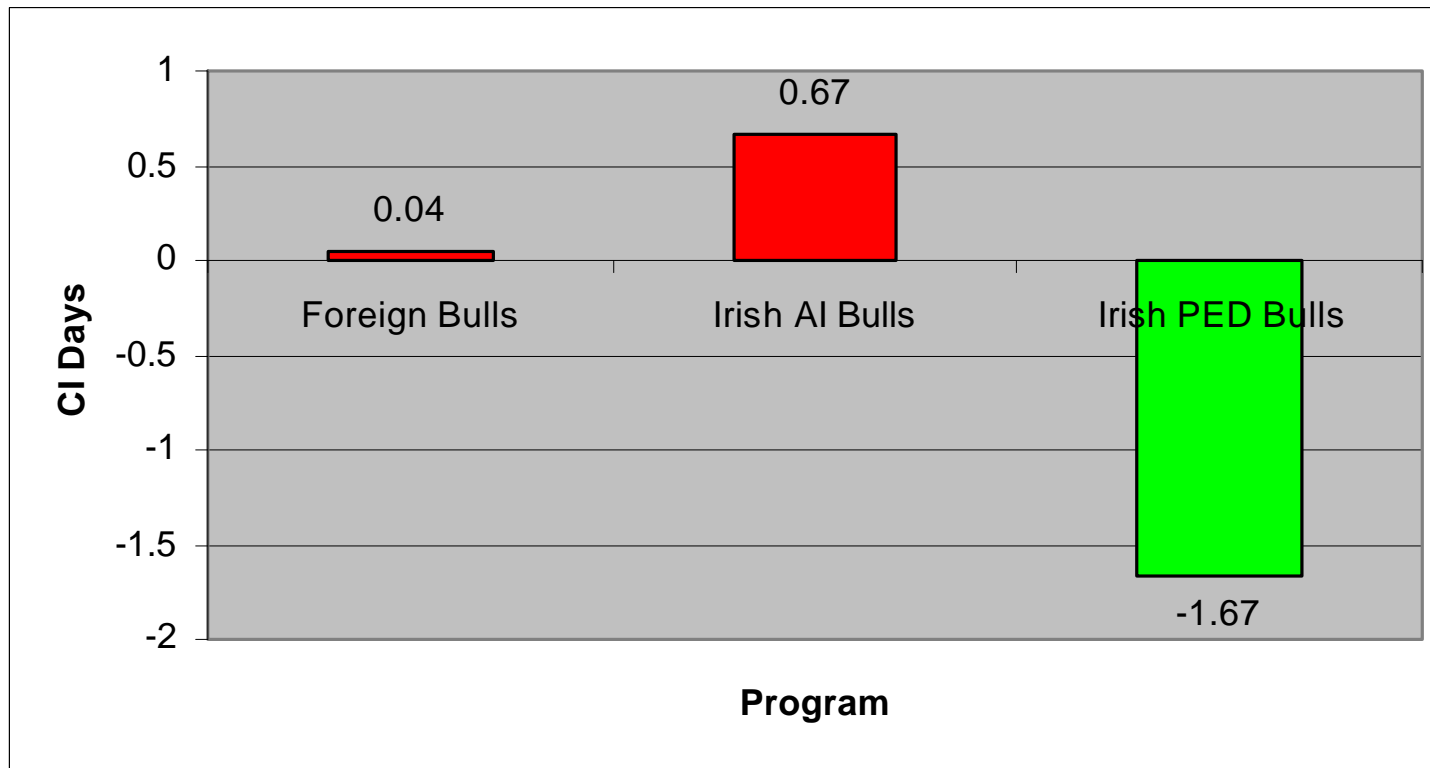
Year 1st proof	Foreign Bulls		Irish AI Bulls		Irish PED Bulls	
	P%	CI Days	P%	CI Days	P%	CI Days
2004	0.01	-0.18	0.00	1.21	0.01	-0.39
2005	0.02	-0.31	-0.01	1.05	0.02	-0.72
2006	0.05	-0.28	0.00	1.24	0.04	-1.03
2007	0.04	0.04	0.00	0.67	0.05	-1.67
2008		1.56	-0.01	2.05	0.07	-1.64

- Comparison of top 100 sires/year from all foreign programs (2,000 sires/year), Irish AI program and bulls in IHFA herds for P% and CI Days
- Irish PED bulls better on P% and CI days than bulls in foreign programs and in current AI program.
- Irish AI bulls – selected for milk kg?

Foreign vs. Irish Bulls (EBI)



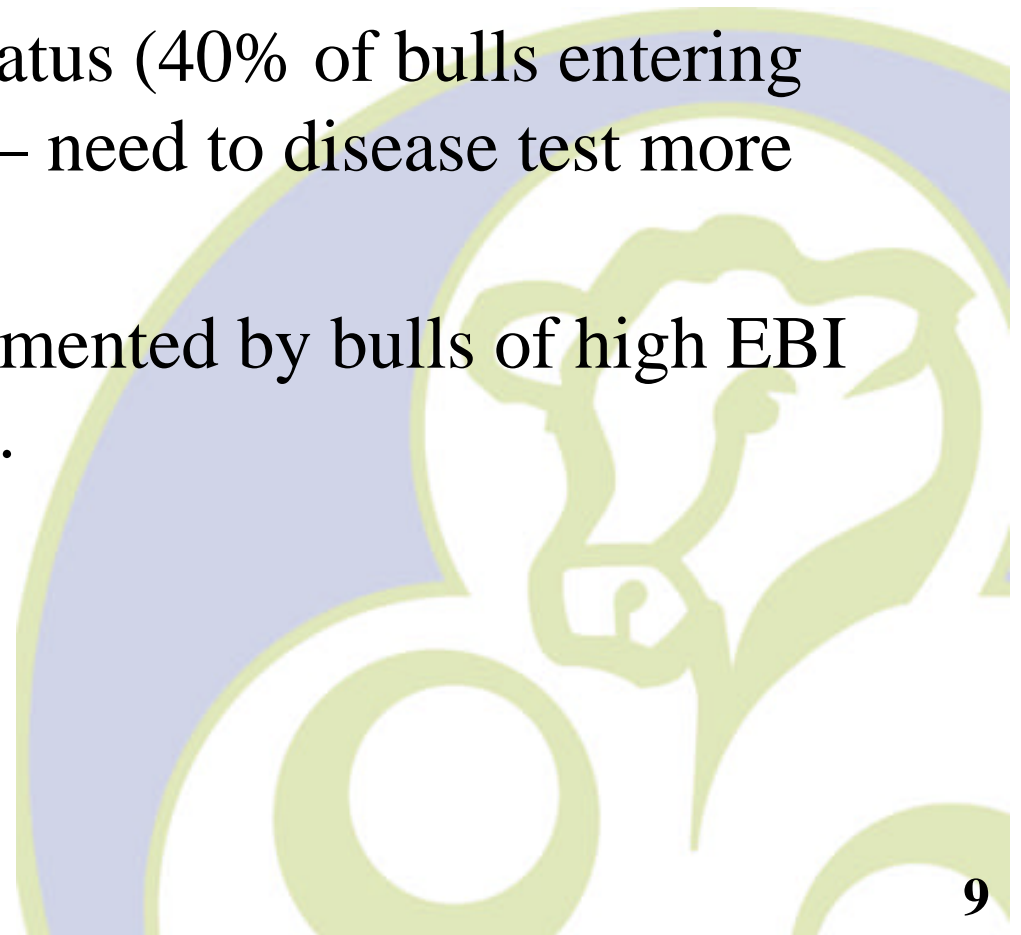
Foreign vs. Irish Bulls (CI Days)



- Irish PED bulls 1.7 days better than best of foreign bulls (on EBI) and 2.3 days better than bulls in Irish program

International Programs - Summary

- Irish young bulls can compete with best of bulls in foreign programs.
- Issues around health status (40% of bulls entering Tully fail health tests) – need to disease test more bulls.
- Program can be supplemented by bulls of high EBI from foreign programs.



Targeted Herd Approach - Principle

- Major cost in progeny testing;
 - Provision of AI service (to get test daughter)
 - Collection of subsequent data (e.g., MR & LIFT)
- Target herds that are prepared to use high % test bull = *lower progeny test cost.*
- Need increased incentives for these herd-owners:
 - Lower charges for cattle breeding services
 - More “farmer-friendly service”
 - Young bulls of high genetic merit.
- “Win-Win” for farmers and for industry

Progeny Testing – Current Approach

- Bulls on test (members) – 36 bulls (2002 insems.)
- Progeny test heifer calves in 2003 – 7,111
- Progeny test herds in 2003 – 2,367 (3 dtrs/herd)
- 56% herds with ≤ 2 progeny (2% with ≥ 10 dtrs)
- Incentives – no “industry” norm;
 - Milk recording credits (eligible only on heifers)
 - Discounted rates for proven bulls
 - Free test bull semen
- High number of herds availing of incentives but adding little to “accuracy” of evaluations.

Targeted Herds – Proposed Approach

- Minimum of 30 test heifers/herd (i.e., >50% 1st serves to test bulls).
- Test heifers by different sires (i.e., 30 sires/herd).
- 4 week breeding season.
- Technician AI only.
- Technician each morning/evening – set-time.
- “Bull-of-day” approach.
- Pregnancy scan at 8 weeks.
- Milk recording - minimum 4 visits ($r=0.95$ with A4)
- Animal Events participation.
- Available for linear inspection (LIFT)

Why use progeny “test” bulls?

No. of Sires	Rel. of Sire	Rel. of avg EBI
1	90%	90%
3	70%	90%
5	50%	90%
25	25%	97%

- Average EBI of young bull teams $\geq \text{€}60$ (higher than that of current proven bulls)
- Average reliability of team of 25 bulls = 97%!
- Element of chance (“test”) removed.
- Targeted herds will quickly become source of genetics for national program (bull mothers) and “potential” export

Targeted Herds – Testing 100 Bulls

- Target of 100 bulls (140 females/bull) = 14,000 test daughters
- 20% test heifers = 70,000 births
- Based on current herds in database need just **458 herds.**

	Target - Test 100 Bulls		
	Herds	Totals	Ave
Births	458	70,456	154
Animal Events Recording	412	45,588	100
Technician AI	147	28,342	62
MR Herds	404	61,531	134
Breed HF replacements	393	18,293	40
HF replacements - Stockbulls	220	5,892	13
HF replacements - AI	373	12,401	27
HF AI replacements - Test	185	912	2
HF AI replacements - Domestic	320	3,078	7
HF AI replacements - Imported	339	8,411	18

- Average herd size = 150 cows (minimum=110 cows)
- Herds are currently breeding 26% HF replacements.
- 78% of replacements to stock bulls and imported semen
- Only 32% using technician AI service
- 12% not in MR (205 herds not in database with >110 births)

Lower Costs – AI & MR (€/cow)

Table 1. Current Cost Model.

Bulls	Herds	Dtrs	Dtrs/Hrd	Herd Size	Cows AI'd	MR Cost	MR Herd	AI Cost	AI Herd	Herd Total	%
30	90	4200	47	233	168	14	€3,267	22	€3,696	€6,963	100%
50	177	7000	40	198	142	14	€2,768	22	€3,132	€5,901	100%
100	458	14000	31	153	110	14	€2,140	22	€2,421	€4,561	100%

Table 2. Future Cost Model - National Test Program

Bulls	Herds	Dtrs	Dtrs/Hrd	Herd Size	Cows AI'd	MR Cost	MR Herd	AI Cost	AI Herd	Herd Total	%
30	90	4200	47	233	168	5	€1,167	9	€1,512	€2,679	38%
50	177	7000	40	198	142	5	€989	9	€1,281	€2,270	38%
100	458	14000	31	153	110	5	€764	9	€990	€1,755	38%

- MR Cost = €5/cow/year
- AI Cost = €9/service (inc. semen cost & call-out charge)
- Cost of AI & milk recording reduced by 62%
- 153 cow herd (test 100 bulls) – AI & milk recording charge = €1,755

Lower Costs – IHFA (€/cow)

Table 1. Current Cost Model.

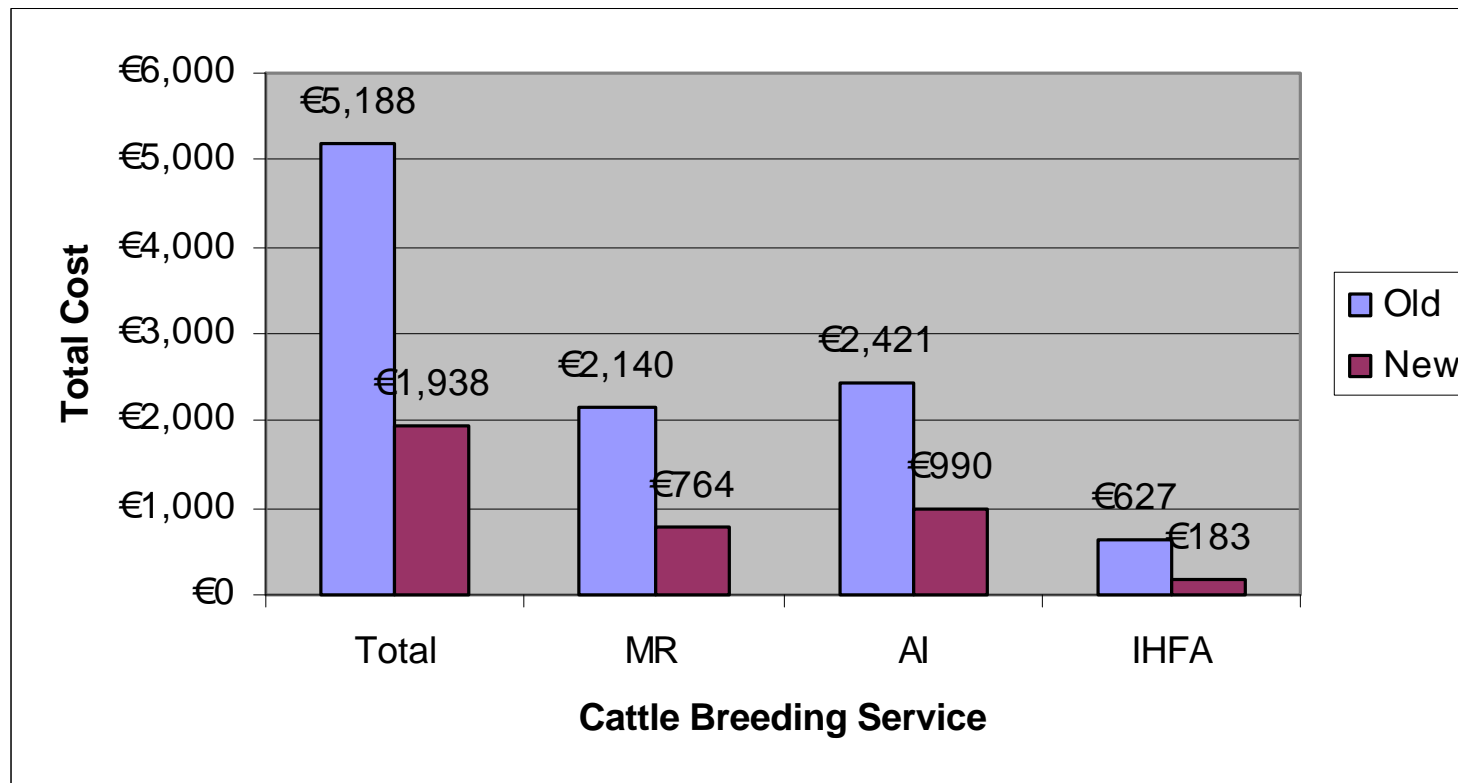
Bulls	Herds	Dtrs	Dtrs/Hrd	PED Cost	PED Herd	LIFT Cost	LIFT Herd	Herd Total	%
30	90	4200	47	€12.0	€560	€8.5	€397	€957	100%
50	177	7000	40	€12.0	€475	€8.5	€336	€811	100%
100	458	14000	31	€12.0	€367	€8.5	€260	€627	100%

Table 2. Future Cost Model - National Test Program

Bulls	Herds	Dtrs	Dtrs/Hrd	PED Cost	PED Herd	LIFT Cost	LIFT Herd	Herd Total	%
30	90	4200	47	€6.0	€280	€0.0	€0	€280	29%
50	177	7000	40	€6.0	€237	€0.0	€0	€237	29%
100	458	14000	31	€6.0	€183	€0.0	€0	€183	29%

- PED cost = €6/registration
- LIFT cost = free (paid for by program)
- Cost of PED registration and linear inspection reduced by 71%
- Reduced “grade-up” charges for non-PED herds

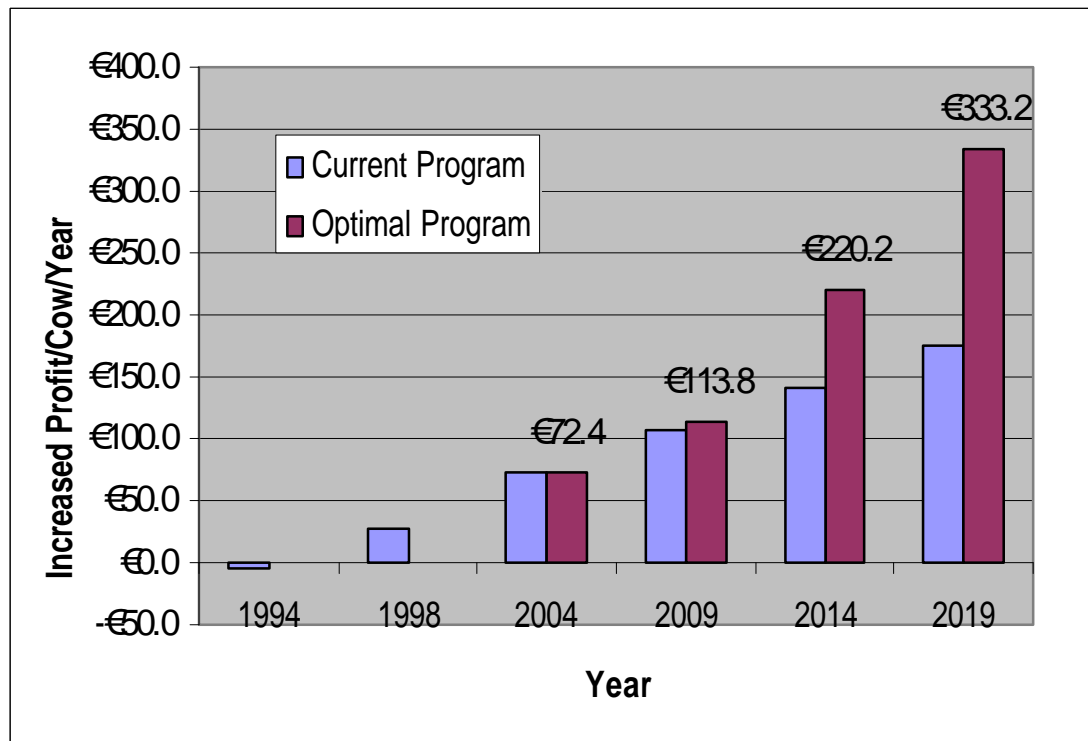
Total Costs - 150 cow herd.



- Benefits of “integrated package” = €3,250/year reduction in cost of cattle breeding services (-63%)

Increased Benefits - Farmers & Industry

	Current Program	Optimal Program	Benefit/cow	Benefit/150 cows	Benefit/litre	% FAPRI price	Industry
1994	-€4.8						
1998	€26.7						
2004	€72.4	€72.4	€0.0	€0	€0.000	0.0%	€0
2009	€106.4	€113.8	€7.4	€1,109.3	€0.001	0.7%	€9,244,265
2014	€140.4	€220.2	€9.8	€1,969.3	€0.016	7.2%	€9,744,265
2019	€174.4	€333.2	€158.8	€23,819.3	€0.032	14.3%	€198,494,265



- Current Gain= €6.8/cow/year
- Optimal Gain (100 bulls/100 dtrs.) = €22.6/cow/year
- Full benefits – take 8 years to “kick-in”
- 12 K/herd in 2014 (150 cows)
- Year on benefits

Out-sourcing Genetics - Cost

Dairy Semen Importation - Cost to Industry					
Breed of AI Sire	2000	2001	2002	Price/straw	Cost to Industry (2002)
H Friesian	157,499	171,232	155,327	€8.0	€1,242,616
Montbeliarde	2,045	7,975	5,510	€8.0	€44,080
MRI	5,766	1,500	4,848	€8.0	€38,784
Jersey	0	0	3,866	€8.0	€30,928
Total	165,310	180,707	169,551	€8.0	€1,356,408

Test Bull (2004-2008) - Origin of Bulls		
Country of Origin	No. Bulls	% Total
Germany	11	5.4%
France	5	2.5%
Ireland	51	25.0%
Netherlands	112	54.9%
USA	14	6.9%
Others	11	5.4%
Total	204	100.0%

- Proven Bulls – 169K doses = €1.4 million/annum.
- Sufficient income to test 100 bulls/annum
- Test Bulls – 75% sourced outside Ireland.
- Trend in wrong direction – only 1 from 20 this year
- *Currently little control of direction in breeding*

Selection of Herds - Summary

- Targeted herd approach ;
 - Reduced cost for AI, MR & IHFA services (€3,250/year in 150 cow herd)
 - Increased genetic gain;
 - 150 cow herd = €11,969/year in 2014
 - €100 million across dairy industry
 - “Farmer friendly” service
 - Knock-on benefits to industry - increased use of services.

Making it happen – Bulls & Herds

Week	Date	Bulls	Herds
Week 1	Feb-16	Contact Herd-Owners re : status of bull.	Sign-up Herds.
Week 2	Feb-23	List bulls to DVO. Start testing & inspection.	Sign-up Herds.
Week 3	Mar-01	Testing & inspection.	Sign-up Herds.
Week 4	Mar-08	Complete testing & inspection.	Sign-up Herds. Non MR herds, 1st MR visit
Week 5	Mar-15	Transport bulls to stud.	Sign-up Herds. Non MR herds, 1st MR visit
Week 6	Mar-22	Start post entry isolation & health tests.	Sign-up Herds. Non MR herds, 1st MR visit
Week 7	Mar-29	Continue post entry isolation & health tests.	Sign-up Herds. Non MR herds, 1st MR visit
Week 8	Apr-05	Continue post entry isolation & health tests.	Forward lists to AI org. for scheduling
Week 9	Apr-12	End post entry isoaltion & health tests.	Forward lists to AI org. for scheduling
Week 10	Apr-19	Semen collection & freezing. Quality Assurance.	Forward lists to AI org. for scheduling
Week 11	Apr-26	Semen collection & freezing. Quality Assurance.	Forward lists to AI org. for scheduling
Week 12	May-03	First bulls for AI.	Commence AI in Targetted Herds

- 2004 AI season (12 week window)
 - Sign-up herds
 - Identify test bulls, disease test, collect semen, dispatch for AI

National AI - Summary

- High EBI bulls are in Irish herds.
- These bulls can compete with best bulls available internationally.
- Large number of herds with correct “profile” for progeny testing; good data, good farm practices, co-operative farmers.
- Program can be put in place at no extra cost to farmers/industry.
- Cost of doing nothing - €20 million/annum & potential collapse of program (foreign competition).
- **Why wait – new National program starting in Spring 2004.**