



IRISH CATTLE BREEDING FEDERATION

Breeding for Better Health: Challenges and Achievements



Siobhán Ring

Animal Health Awareness Day – 28th November 2019

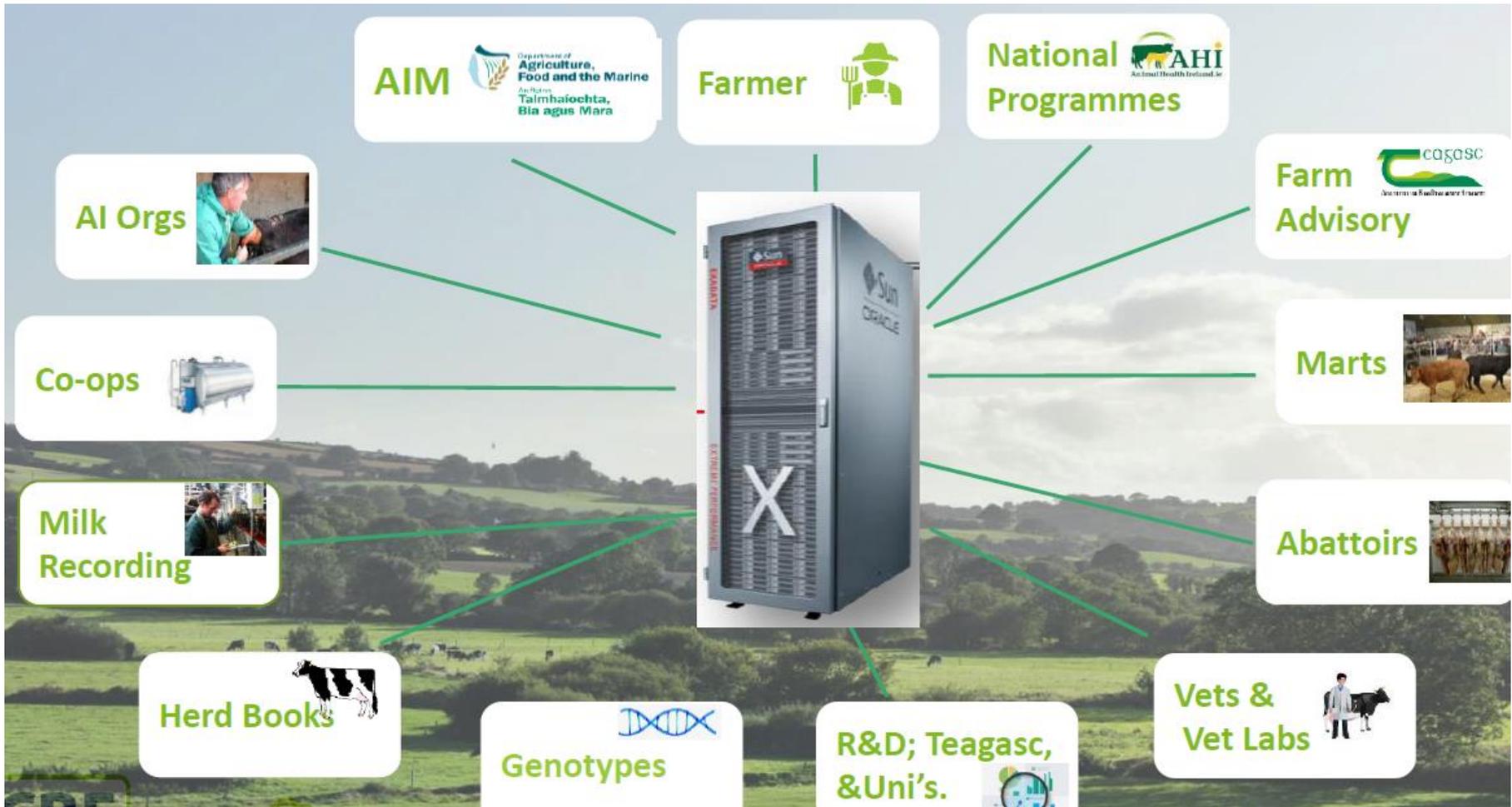
Setting the Scene

- Animal breeding and ICBF
- Achievements
 - Growing central database – farmers, vets, AHI, DAFM
 - Progress to-date
 - HealthyGenes Project – genetic evaluations for resistance to bTB & Liver Fluke
- Challenges
 - Data – quantity, quality & frequency
- Utilising your opportunity to breed for better health
 - Using the breeding values
 - Recording health & disease – what would encourage you to record?

“Genetics creates the potential, management realizes the potential, disease destroys the potential”

The ICBF Database

- Aim to maximize profit/sustainability for dairy and beef farmers through genetics/genomics & data integration



How Genetic Evaluations Work

Herds A, B, C: Health & Pedigree known

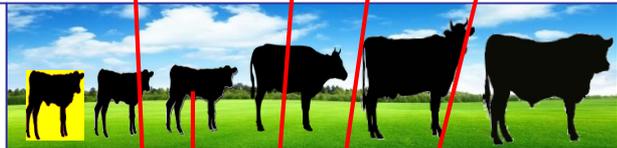
Herd A



Herd B



Herd C



Herds D, E, F: Only pedigree known

Herd D



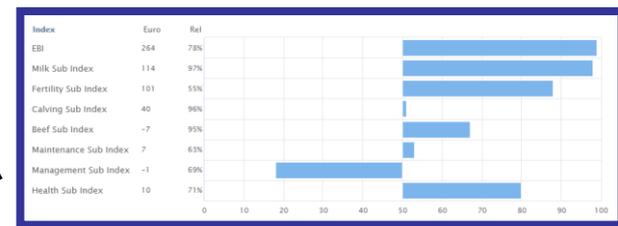
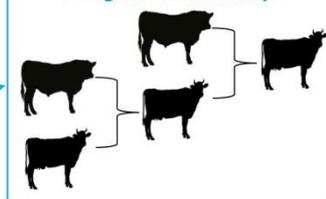
Herd E



Herd F



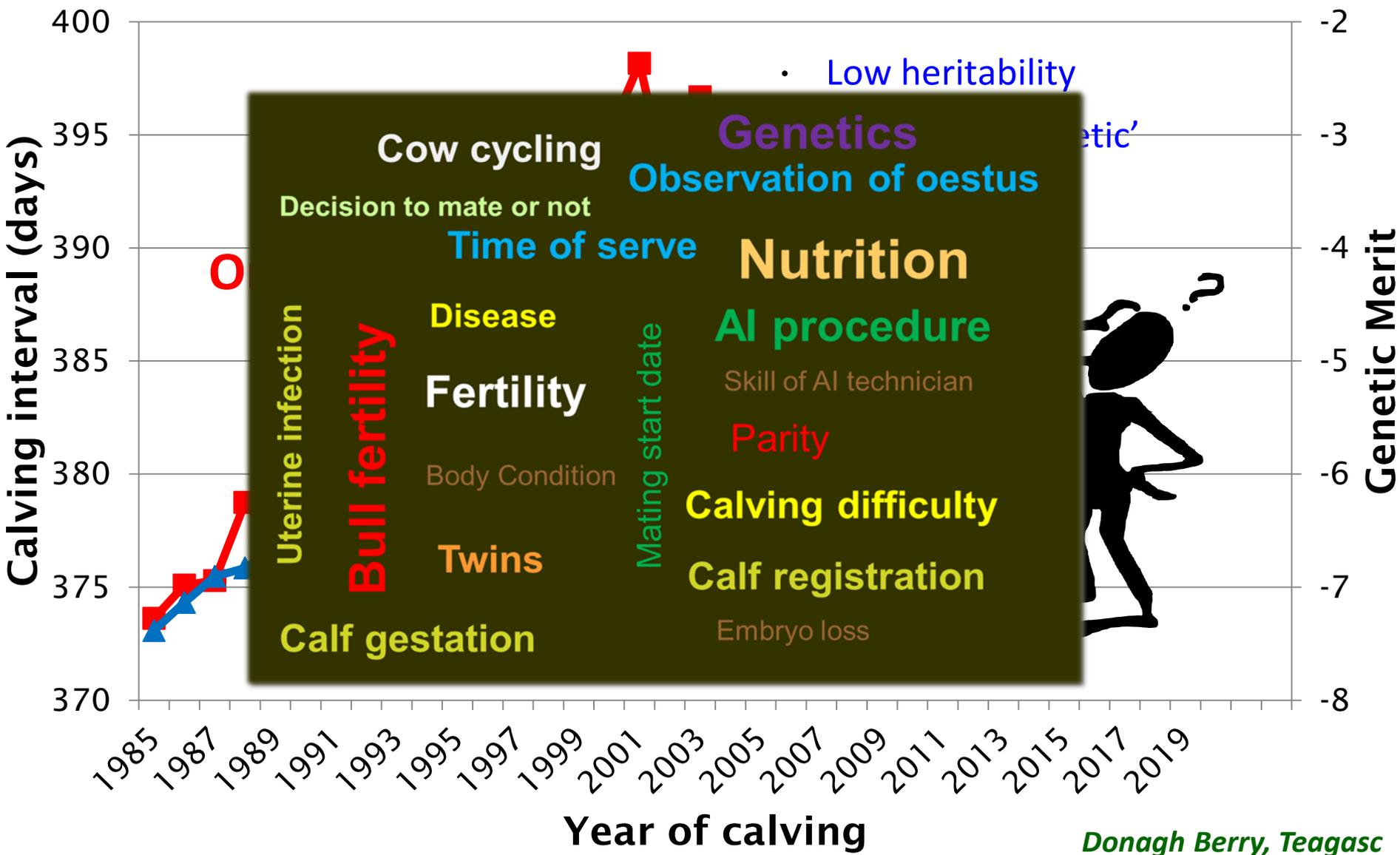
Pedigree Relationship



Star Rating (within Limousin breed)	Economic Indexes	€uro value	Index reliability	Star Rating (across all beef breeds)
★★★★★	Replacement (per daughter lactation)	€131	95% (V High)	★★★★★
★★★★☆	Terminal	€121	97% (V High)	★★★★☆
★★★★★	Dairy Beef	€90	97% (V High)	★★★★★

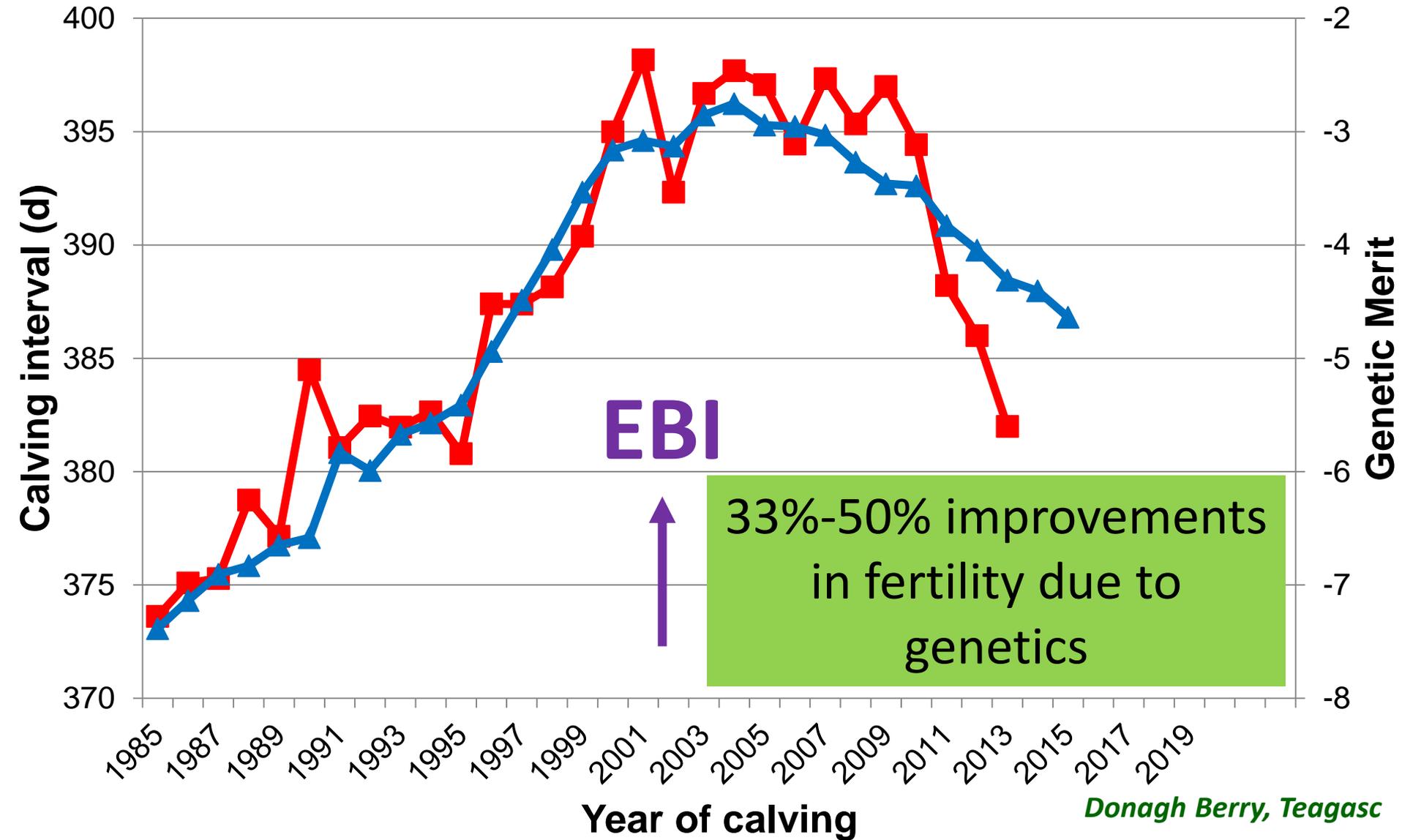
Genetic merit generated for all animals

Breeding and Fertility



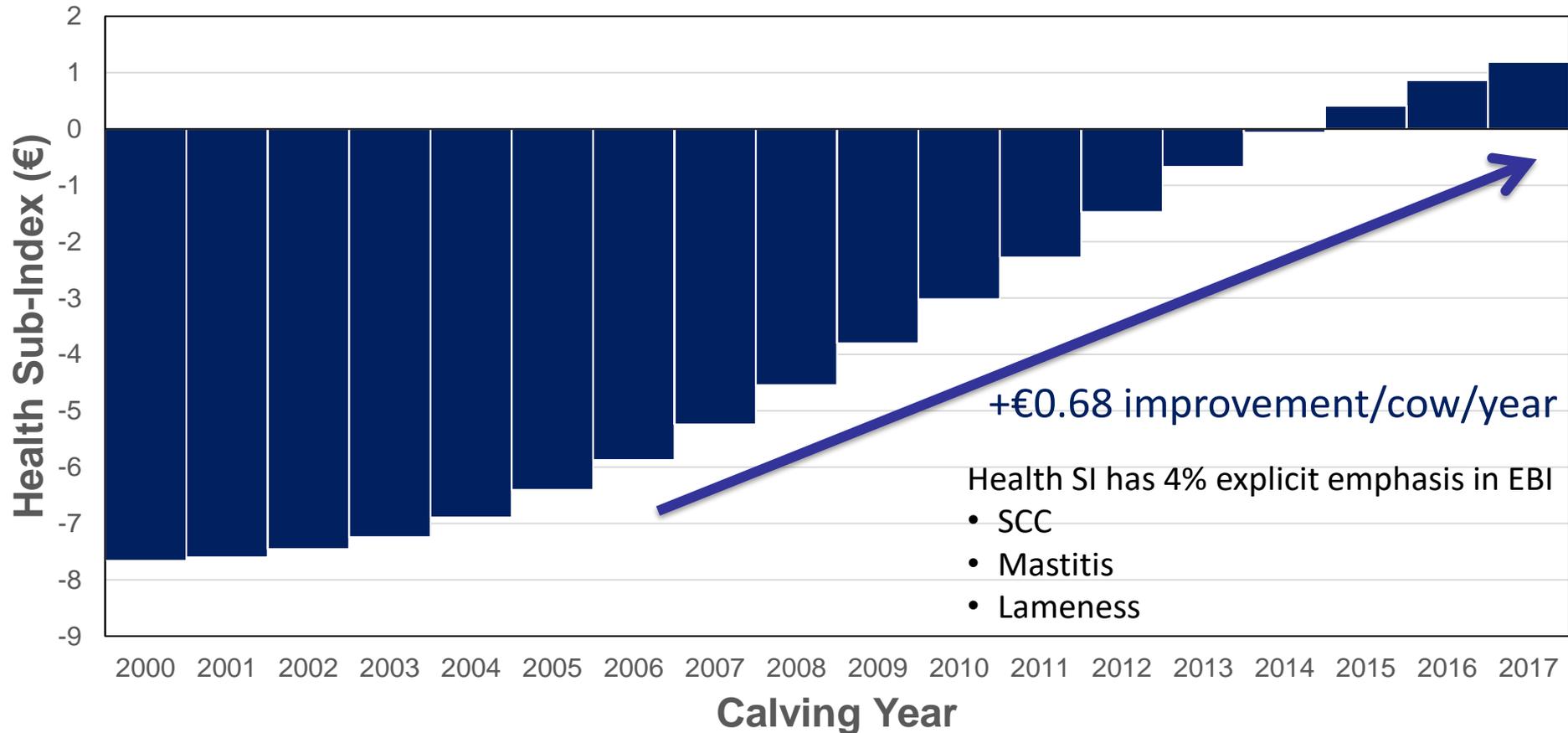
Donagh Berry, Teagasc

Despite the Odds



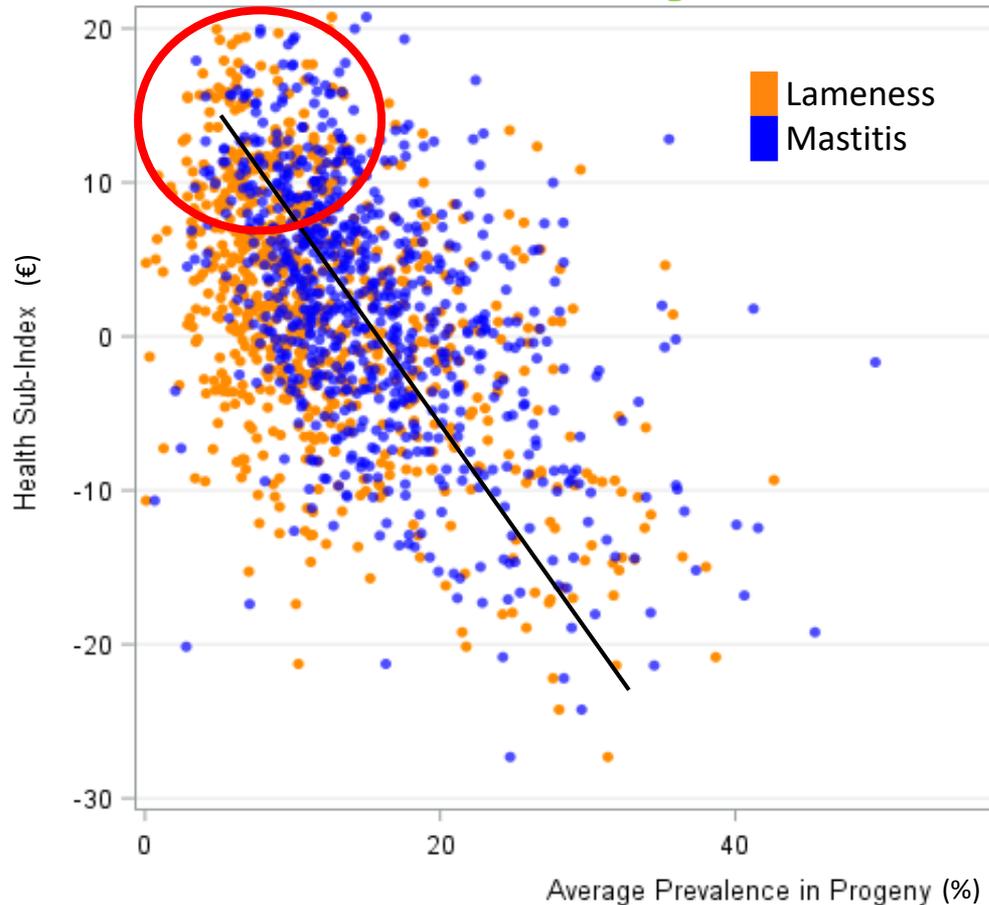
Donagh Berry, Teagasc

Today's Cows are Genetically Healthier



3 Times Faster Improvement in Health Traits After Inclusion in EBI (Dairy Breeding Goal)

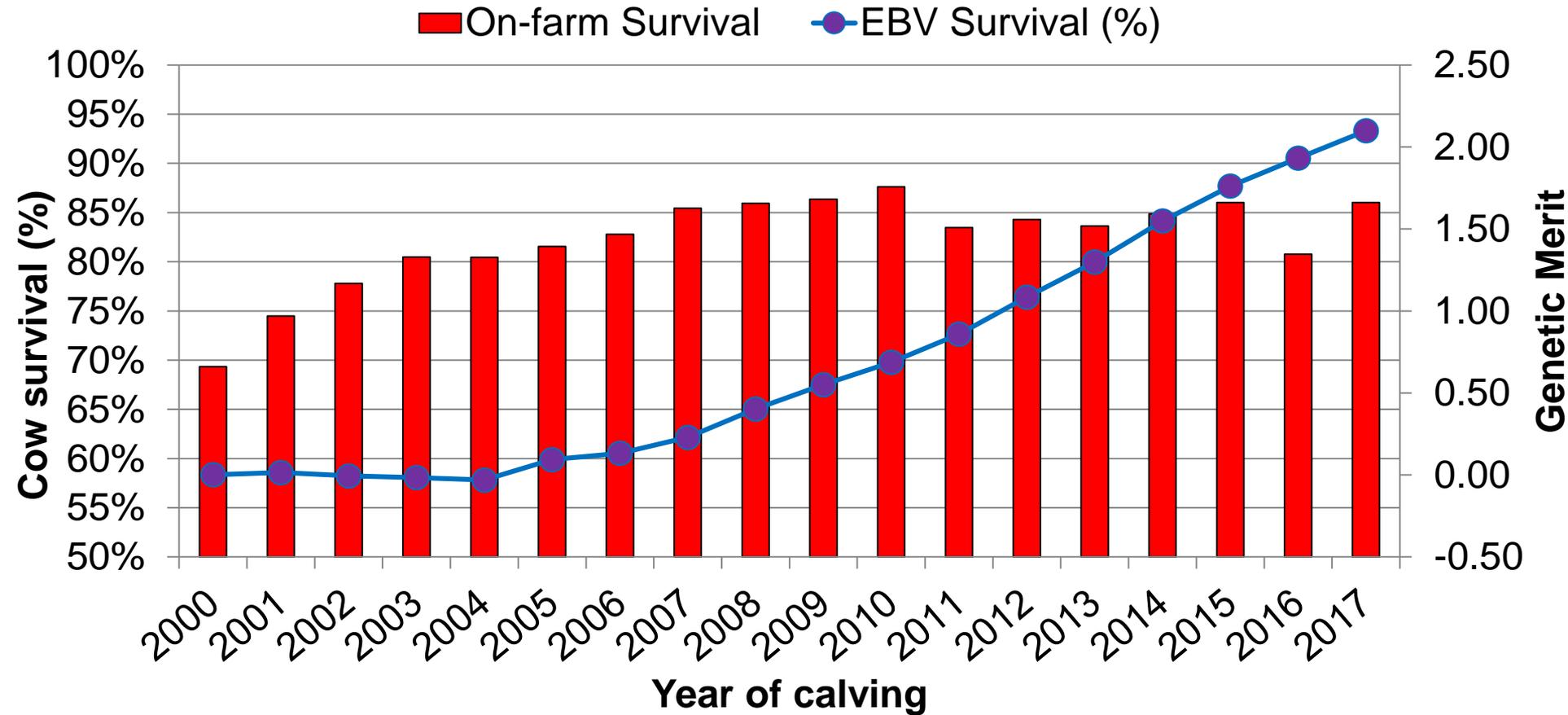
Do They Have Less Disease?



Health SI	Expected Herd Prevalence	
	Lameness	Mastitis
-€10	17%	20%
-€5	15%	18%
€0	13%	16%
€5	11%	13%
€10	8%	11%
€15	6%	9%
€20	4%	7%

Higher Health Sub-Index = Less Lameness, Mastitis & SCC

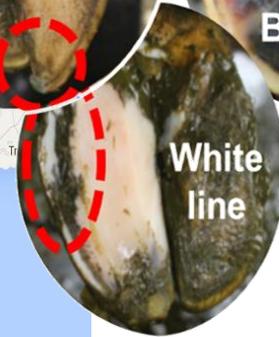
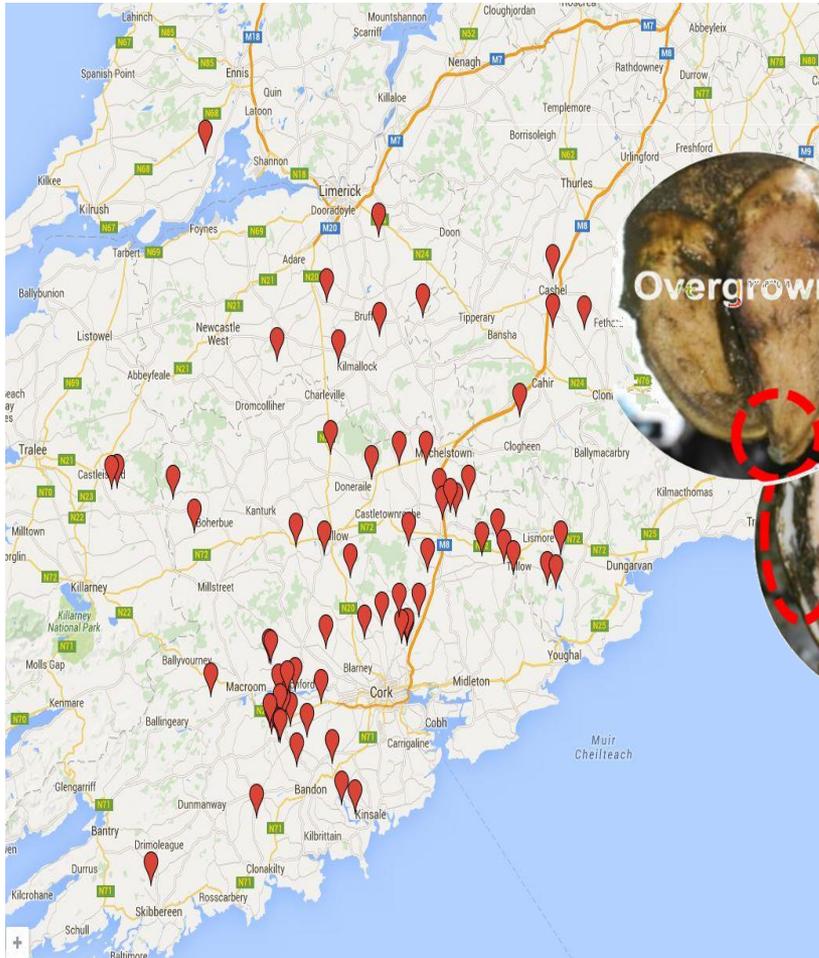
Today's Cows are Living Longer



Cows surviving an extra 174 days on-farm through a combination of health & fertility improvements

HealthyGenes Project

- 11,000 cows in 68 herds
- Assessed for a range of health and disease traits & hoof trimmed



Considerable exploitable genetic variation in all traits investigated!

Breeding can reduce:

- ✓ TB
- ✓ Liver fluke
- ✓ Hoof lesions
- ✓ Johne's Disease
- ✓ Neospora
- ✓ Stomach worms
- ✓ BVD & IBR

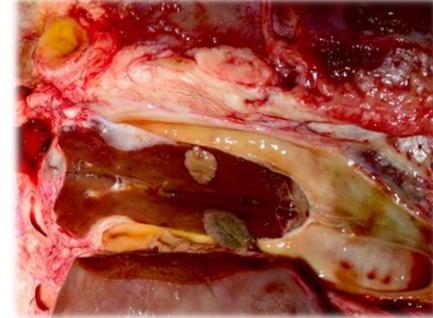
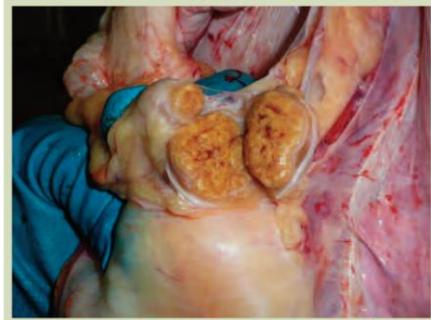
Resistance to TB & Liver Fluke



TB



Liver Fluke



SICTT, lesion, & confirmed lab TB

Damage & live fluke

Factors Influencing TB & Liver Fluke Infection

Incorrect animal identification

Testing procedure

Stage of infection

Animal movements

Weather

Test accuracy

Wildlife reservoirs

Grazing behaviour

Stocking density

Exposure to pathogen

Attraction to parasite

Interaction with wildlife

Contiguous herds

Residual Infection

Host genetics

Animal genetics

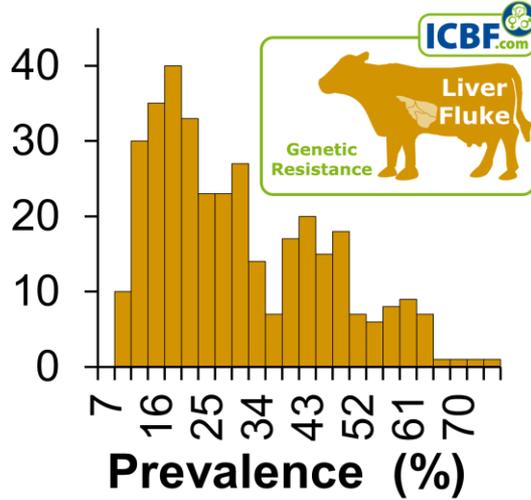
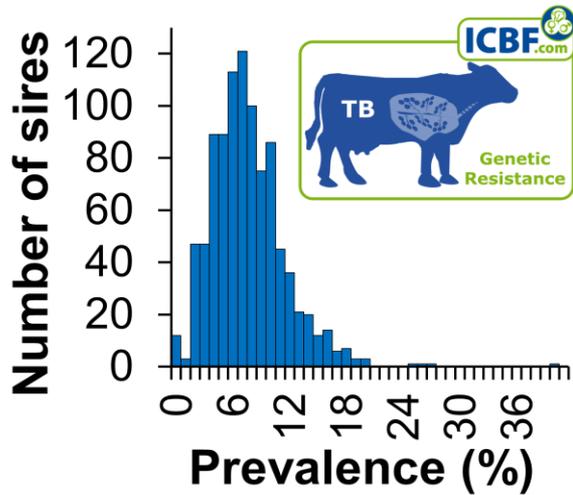
Immune response pathways

Wildlife-cattle pathways

Cattle-cattle transmission



Resistance to TB & Liver Fluke



- Jan'19 breeding values for resistance to TB & Liver Fluke launched
- Available for dairy and beef cattle

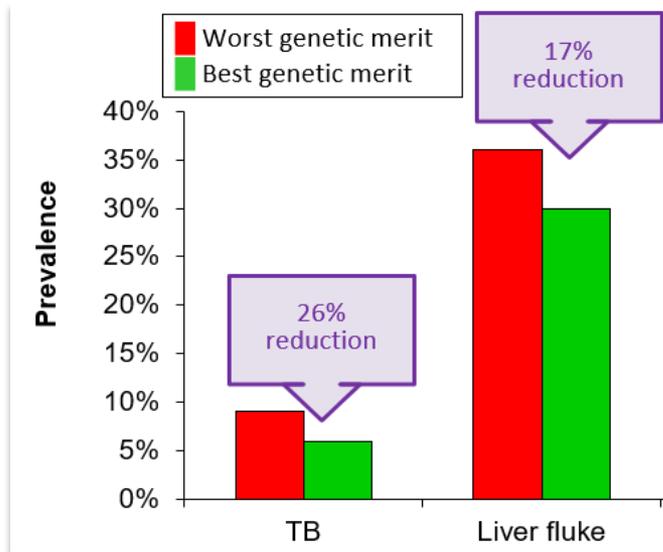
Traffic light system for using TB and liver fluke resistance breeding values



⇒ Highest overall index bulls with highest predicted prevalence of infection

⇒ Highest overall index bulls with average predicted prevalence of infection

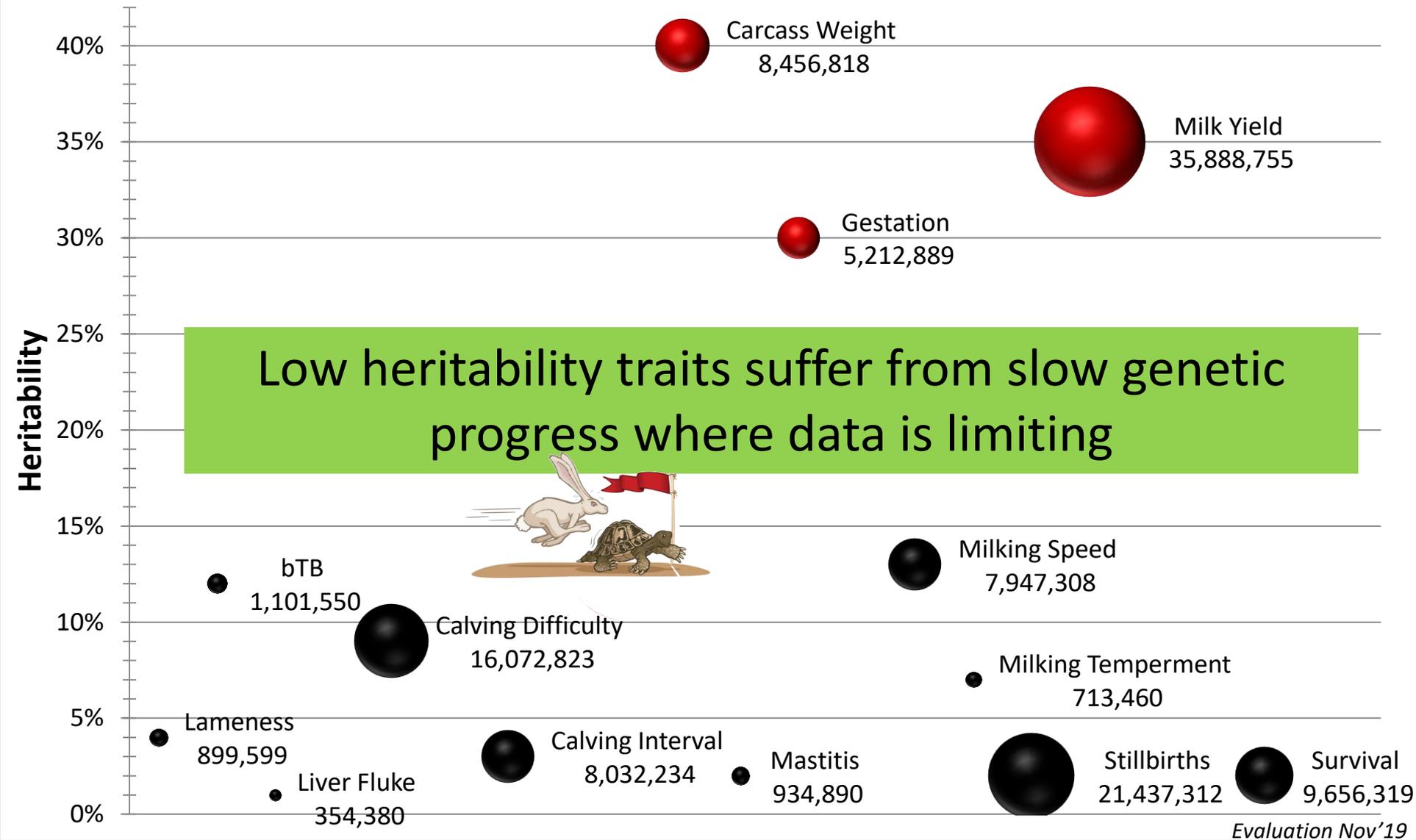
⇒ Highest overall index bulls with lowest predicted prevalence of infection



At current state of play TB eradication expected:
2,185

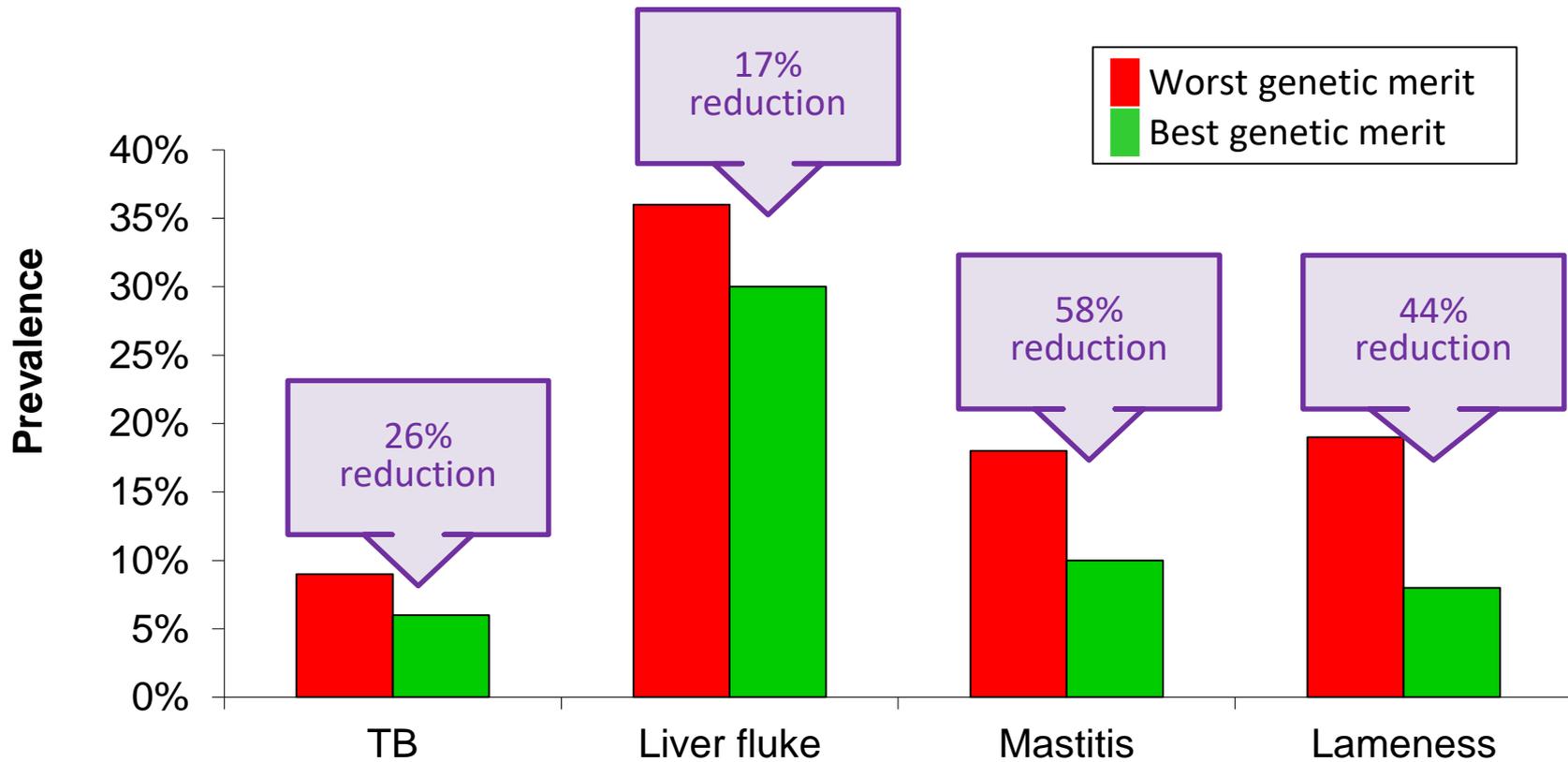
Potential through breeding – eradication achieved by
2,022

Data Limiting Genetic Progress in Health



Evaluation Nov'19

Despite fewer records and low heritability, genetic merit still able to differentiate the best and worst animals



Identifying the Health Status of Your Herd

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	97	94		€ 43	€ 52	€ 36	€ -7	€ 4	€ 2	€ 2	
Missing EBI*	0	7.2 0.06	1.5	29.5%	35.8%	24.6%	-4.5%	2.4%	1.5%	1.7%	€ 133
Total Cows	97	6.2 0.05	-2.7								
1st Lactation	23	132		€ 54	€ 54	€ 42	€ -8	€ 3	€ 2	€ 2	
		8.4 0.06	1.5	32.7%	33%	25.2%	-4.9%	1.6%	1.3%	1.2%	€ 148
		8.2 0.06	-2.8								
2nd Lactation	24	103		€ 48	€ 51	€ 38	€ -8	€ 4	€ 3	€ 2	
		8.1 0.07	1.5	31.6%	33.1%	24.5%	-5.2%	2.5%	1.8%	1.3%	€ 137
		7.0 0.06	-2.6								
3rd Lactation	12	119		€ 56	€ 42	€ 41	€ -6	€ 3	€ 3	€ 3	
		11.3 0.11	1.6	36.7%	27.3%	26.8%	-3.9%	1.8%	1.7%	1.8%	€ 140
		7.3 0.06	-1.7								
4th Lactation	12	73		€ 38	€ 35	€ 28	€ -6	€ 6	€ 1	€ 4	
		6.9 0.07	1.3	32%	29.8%	23.9%	-4.9%	4.9%	1%	3.4%	€ 107
		5.1 0.04	-1.5								
5th Lactation (+)	26	49		€ 25	€ 64	€ 31	€ -5	€ 3	€ 2	€ 3	
		3.7 0.03	1.5	18.9%	48.6%	23.2%	-3.4%	2.4%	1.5%	2%	€ 123
		3.7 0.03	-3.6								

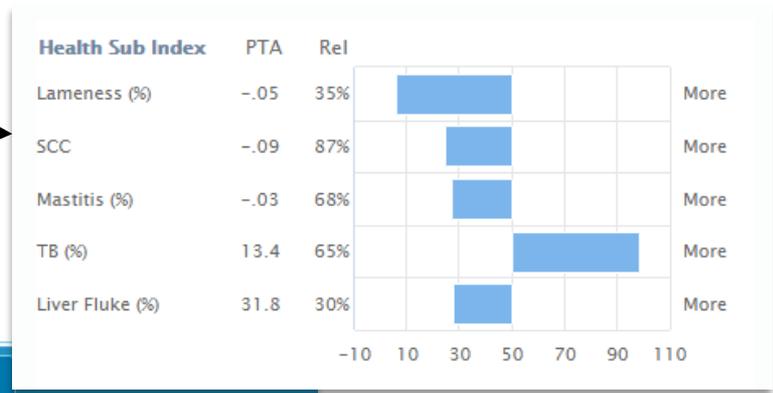
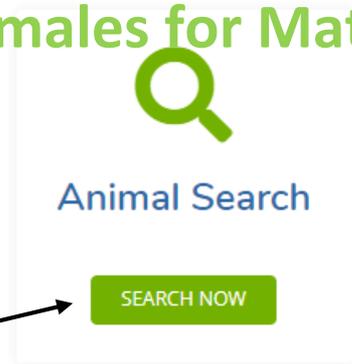
2. Dairy Youngstock

2019 Calves	30	75		€ 68	€ 87	€ 44	€ -10	€ 2	€ 4	€ 1	
Missing EBI*	0	10.0 0.12	2.4	31.4%	40.4%	20.3%	-4.7%	0.9%	1.9%	0.4%	€ 196
Total Calves	30	9.1 0.12	-4.6								
2018 Calves	28	122		€ 63	€ 64	€ 42	€ -8	€ 6	€ 3	€ 4	
Missing EBI*	0	9.8 0.08	2.0	33.2%	33.6%	22.2%	-4.2%	2.9%	1.6%	2.2%	€ 173
Total Calves	28	9.1 0.08	-3.1								

When choosing bulls for breeding aim for higher Health SI than herd average and higher overall index (EBI)

Using the Breeding Values – (Selecting Males/Females for Mating)

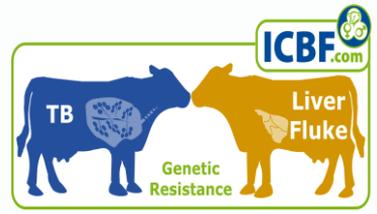
- 1 Log on to www.icbf.com
- 2 Search animal (tag/aicode)
- 3 View genetic merit (PTA)
 - Lower PTA values = healthier animals



EBI Summary | Milk | Fertility | Calving | Beef | Health | Conformation | **TB And Liver Fluke** | Pedigree | Previous Evaluation

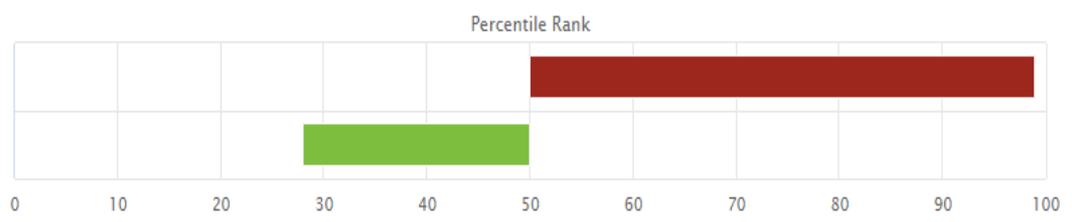
Breeding for resistance to TB and Liver Fluke can help protect your herd from TB and Liver Fluke infection.

Each animal's breeding value is expressed as the predicted prevalence of TB or Liver Fluke for that animal's progeny. Therefore, a lower PTA value is more desirable



Compare Evaluations

Trait	PTA	Reliability
TB (%)	13.4	65% (High)
Liver Fluke (%)	31.8	30% (Low)



Recording Health and Disease Events

- www.icbf.com
- HerdPlus App
- Complete Paper Health Surveys – due in December
- Text “LAME Jumbo” or “Mast Jumbo” to 089 457 7663

ICBF.com Irish Cattle Breeding Federation

HOME ADMIN REPORTS RECORD EVENTS VIEW PROFILES APPLICATIONS

Record Health and Disease Events Record health issues that

No Events to Record Last Updated: N/A.

To record a Genetic Defect please click [here](#)

Showing 1 to 101 of 101 entries

Jumbo AnimalTag From Date To Date Sex

Jumbo	Animal Tag	Birth Date	Sex
40	372224436050040	27-SEP-18	F
69	372214565010069	14-JUN-18	F
71	372214565040071	05-JUL-18	F
147	IE151194020147	22-SEP-17	F
161	372223474230161	26-APR-19	F
243	IE151844540243	23-NOV-14	F
369	372215015080369	19-JAN-18	F
372	372223635650372	01-AUG-18	F
374	372223635670374	17-AUG-18	F
378	IE151241810378	07-FEB-13	F



Health and Temperament Survey Recording Sheet

Herd owner: John A. Farmer

Herd no: B1234568

Print Date: 30-Sep-11

Circle ONLY where Milking Temperament is Average or Poor. All other animals will be assumed as having Good temperament.

Circle Mastitis or Lameness events ONLY where they have occurred.

Cows which were in your herd at any point since 01-Jan-2017.

Cow Jumbo	Tag Number	Currently In Herd	Milking Temperament		Mastitis		Lameness	
			P = Poor A = Average (circle relevant)		1 = 1 case 2 = 2+ cases (circle relevant)		1 = 1 case 2 = 2+ cases (circle relevant)	
123	IE123456789123	Y	A	P	1	2	1	2
124	IE123456789124	Y	A	P	1	2	1	2
125	IE123456789125	Y	A	P	1	2	1	2
126	372123456789126	Y	A	P	1	2	1	2
127	372123456789127	Y	A	P	1	2	1	2

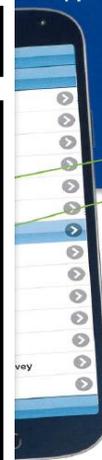


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HerdPlus App

to introduce our mobile app

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- Record essential data anytime, anywhere e.g. dry-offs, serves, lameness and mastitis.
- View Profiles for live, up to date information e.g. EBI and Fertility.



Ph: 023-8820452 www.icbf.com



Conclusions

- Breeding is a sustainable way of reducing disease, complementary to current management practices
- The lack of availability of records is a major challenge to achieving faster improvements
- Record events on www.icbf.com or text “LAME Jumbo” or “Mast Jumbo” to 089 457 7663
- Use breeding values/genetic merit available for
 - Higher € value is better
 - Lower PTA values for SCC, Mastitis, Lameness and mortality = less disease
- Increasing importance of health & welfare will resonate in future breeding goal iterations (beef & dairy)
 - Scour, Pneumonia, Johnes, IBR, mortality in later life etc.
 - Herd health reports





Our Farmer & Government Representation



Our AI & Milk Recording Organisations



Our Herdbooks



Acknowledging Our Members